LIBRARY OF PRINCETON
JUL 26 1928
THEOLOGICAL SEMINARY

Division HV5816
Section .T32

Digitized by the Internet Archive
in 2024 with funding from
Princeton Theological Seminary Library

https://archive.org/details/opiumproblem00terr

THE OPIUM PROBLEM

LIBRARY OF PRINCETON
JUL 26 1928
THEOLOGICAL SEMINARY

by

Charles E. Terry, M.D.
and
Mildred Pellens

for

The Committee on Drug Addictions
in collaboration with
The Bureau of Social Hygiene, Inc.

NEW YORK
1928

Copyright, 1928
By the Bureau of Social Hygiene, Inc.
370 Seventh Ave., New York

Printed in the United States of America
By the Haddon Craftsmen
Where Federal Crosses Nineteenth, Camden, N. J.

TABLE OF CONTENTS

PAGE

PREFACE xi

Personnel of committee—Objects—Scope of work—Procedure.

INTRODUCTION xv

The problem—In the United States—Controversial aspects—Method of study—Terminology.

CHAPTER I—EXTENT 1

Numbers involved—Difficulties of determination—Current statements—Estimates from importations—Estimates from surveys—Early statements, 1867-1871—Michigan survey, 1878—Chicago study, 1880—Iowa study, 1885—Massachusetts study, 1888—Vermont study, 1900—Jacksonville survey, 1913—Tennessee survey, 1915—Treasury Committee, 1918—New York City Clinic, 1919—Narcotic Drug Control Commission, 1920—Los Angeles Clinic, 1920—Shreveport Clinic, 1919-1923—Summary survey and estimate table—Recent analysis of certain surveys, Kolb and Du Mez—Analysis and discussions—Résumé.

CHAPTER II—DEVELOPMENT OF THE PROBLEM 53

Historical review of use of opium—Use by Sumerians and Assyrians, Mention in Eber's Papyri—Homer's Iliad—Known to Hippocrates, Theophrastus, Virgil—Virtues described by Galen—Discovery of alkaloids—Therapeutic uses—Appreciation of euphoric effect—De Quincey—The hypodermic syringe—Influence of Civil and other wars—Influence of opium smoking—Patent medicine industry as factor—Secret addiction remedies—Medical education—Professional indifference—Production of heroin—Views on safety and dangers of heroin—Early warnings—Effect of prohibitory laws—Underworld traffic—Effect of professional attitude and training—Résumé.

CHAPTER III—ETIOLOGY 94

Incompleteness of studies—Faulty generalizations—Racial and individual tendencies—Effect of climate—Influences of medical use—Use in infancy and childhood—Use of hypodermic—Painful illnesses—Use for pain and for euphoria—Massachusetts study as to causes—Pichon's studies—Psychical influence—Patent medicines and self-medication—Evil associations—Dissipation—Chinatown—"Contagion"—Influence of personality make-up—Curiosity—Craving for stimulants and sedatives—

PAGE

Report of British Departmental Committee on Morphine and Heroin Addiction—Table, replies to questionnaires, Treasury committee report—Replies to questionnaires of Committee on Drug Addictions—Criminal tendencies and associations—Résumé.

CHAPTER IV—GENERAL NATURE 137

Definitions, effect on control measures—Early opinions and terms—Psychical and ethical effect—Like alcoholism—Morphinism not morphinomania—A vice, habit, appetite—Mental and physical disease—An uncontrollable craving—A real disease—A psycho-physical disorder—A psycho-somatic affection—A true disease—A drug, auto- and intestinal intoxication—A true organic disease—A psychical disturbance—A functional poisoning—A neurosis or psychosis—A pernicious habit—A definite physical disease—A pathologic entity.

CHAPTER V—PATHOLOGY—SOMATIC AND PSYCHIC CHANGES 166

Reports of findings scanty—Incompleteness of studies—Functional disturbances—Individual tolerance and intolerance—Fatty degeneration of heart and liver—Morphin in liver—Mental deterioration—Ethical changes—Crystals in blood—Effect on leukocytes—Epithelial changes—Lowering of resistance—Arrest of phagocytosis—Character changes—Hallucinations and delusions—Brain cell changes—Effect on endocrine system—Pleasure and deterioration—Generative functions depressed—Changes in cortical cells—Changes entirely functional—The blood in morphinists and heroinists—Coagulability—Number of red cells—Number and changes in white cells—White cell resistance—The blood during withdrawal—Number and varieties of red cells—Hemoglobin percentage—Red cell resistance—Leukocytosis—Differential findings—Leukocytic resistance—Similarity to infectious processes—Changes in liver morphologic and functional—Digestive tract—Albuminuria and sediment findings—Nature of albuminuria—Abscesses—The skin and teeth—Sexual apparatus—Eliminatory crises—Stages of psychic changes—Pulse in tolerance and withdrawal—Relapse due to psychic changes—Other causes of psychic changes than the drug—Effect of opium on dog's intestine—Effect on respiration in dogs—Lipoid changes—Constitutional make-up of users—Excretion of morphin—Mental effects—Inhibitory effect of opium—Auto-intoxication—Allergic reaction—Changes in viscosity of blood—Withdrawal phenomena due to organic causes—Digestive hemoclastic reaction—Morphin delirium—Effect of chronic poisoning on growth of rats—Effect on vegetative nervous system—Resulting psychical changes—Lowered biotonus—Resemblance to manic-depressive states—Relationship to hyper- and hypothyroidism—Selective absorption by nervous system—Effect on basal metabolism—Effect on nutrition—Review of mechanism of tolerance—Conditioned salivary reflex—Somatic and psychic habituation—Specificity of habituation—Evidence of diphasic

Page

poisoning—Vagus-sympathetic balance of vegetative nervous system—Relationship of tolerance to uremic changes—Effect on unstriped muscle—Sensitiveness of intestinal muscles not lost—Brain cell changes—Calcium and potassium blood concentration—blood changes in dogs.

Chapter VI — PATHOLOGY (continued) — TOLERANCE — DEPENDENCE—WITHDRAWAL 312

Tolerance-formation admitted—Dependence questioned—Codein tolerance, committee report—Elimination of codein—Codein not addiction-forming—Codein addiction-forming—Contradictory opinions—Case reports, codein addiction—Dual action of opium alkaloids—Tolerance to eukodal—Effect of eukodal and parakodin on animals—Questionnaire study on codein addiction—Oxidimorphin theory—Hyperacidity in morphinism—Tolerance similar to true immunity—Specific antitoxin formed—Morphin storage in brain and liver—Inhibition of glandular function—Release of inhibition—Hypersecretion and glandular engorgement—Epithelial desquamation—Eliminatory crises—Increased power of organism to destroy morphin as explanation of tolerance—Denial of antitoxin formation—Increased ability of body cells to withstand morphin—Brain extract of morphinized animals, properties—Precipitation reaction of morphin serum—Increased ability of organism to destroy and cell immunity both reasons for tolerance—Complement fixation tests and anti-complementary action in morphin serum—Ability of liver to destroy morphin—Withdrawal symptoms due to retained excrementitious matter—Aggressins produced by morphin—Progressive cell adaptivity—Effect on circulation of injections of morphinized serum—Loss of cell sensitiveness in chronic poisoning—Specificity of morphin poisoning—Effect on vegetative nervous system of chronic poisoning and of withdrawal—Tolerance and withdrawal due to antitoxic substance in blood—Chemical changes in nerve cell composition cause of withdrawal—Personality changes and sensation obtunding with reactions—Metabolic changes in rats caused by thyroid, thyroidectomy and morphinism—Psychiatric aspects—Lowering of threshold of resistance—Effect on brain lipoids—Relationship to permeability of cell membrane—Reaction to intradermic injections—Congenital addiction—Effect of withdrawal on pregnancy—Withdrawal symptoms in new-born—Case reports—Prolongation of pregnancy—Morphin in placental circulation—Transmission to fœtus—Questionnaire studies of Committee on Drug Addictions—Tables—Résumé.

Chapter VII—SYMPTOMATOLOGY 429

Detection of chronic use—Classification of symptoms unsatisfactory—Abstinence symptoms diagnostic—Symptoms in smokers—Symptoms in chronic poisoning and in withdrawal—Mental symptoms—The skin and mucous membranes—Pupils—Kidneys—Sex organs—Nervous system—

Page

Vasomotor symptoms—Reflex irritability—Lachrymation—Coryza—Neuralgic pains—Insomnia—Vomiting and purging—Constipation—Pulse irregularity—Collapse—Effects vary in individuals—Salivation in dogs—Nutrition in dogs—Withdrawal symptoms in dogs—Withdrawal like an infectious disease—The "vital need"—Mental state in withdrawal—Respiration—Circulatory symptoms—Syncope—Oliguria and anuria—Albuminuria—Glycosuria—Casts—Memory damaged—Character changes—Effect on volition—Interference with secretion and excretion—Fever—Circulatory disturbances in dogs—Vegetative nervous system and endocrine disturbances—Addiction and withdrawal symptoms in dogs.

Chapter VIII—TYPES OF USERS 468

Classification desirable—Factors to be considered—Incompleteness of data—Dangers of generalizing from available material—*Sex Distribution*—Michigan survey—Chicago study—Iowa study—Jacksonville survey—Tennessee survey—Philadelphia series—Treasury committee—New York City prison cases—New York City clinic series—Discussion—*Age Distribution*—Chicago cases—Iowa cases—Jacksonville series—Tennessee series—Philadelphia hospital cases—Bellevue Hospital cases, New York—New York City clinic cases—Lambert's cases—Court cases, New York—Teachers College questionnaire study, New York—School children—Juvenile court studies—Use by children exaggerated or unfounded—Age of convicted addicts in certain prisons—*Form of Drug Used*—Therapeutic choice—Individual selection—Influence of illicit traffic, reasons—Heroin among young males—Effect of prohibitory laws on use of heroin—Table by drugs used—*Other Classifications*—Conditions in England, 1871—Individual opinions of types involved by authors from 1871 to 1922—Contradictory views due to studies of selected cases—Effects of other drugs, "mixed addiction"—Effect of environmental factors on "type" determination—Dangers of conclusions based on insufficient data—No one type of user—All groups susceptible—Relation to crime—Résumé.

Chapter IX—TREATMENT 517

Early efforts—Influence on treatment of current views on nature—Prophylactic considerations—Gradual reduction—Abrupt withdrawal—Rapid reduction—Substitution—Levinstein's method—Rapid withdrawal with bromides—Erlenmeyer's method—Jennings' method—Rapid detoxication, Sollier—Hyoscine treatment, Lott—Pettey's treatment—Use of heroin, Morel-Lavallée—Lambert-Towns treatment—Bishop's principles, interval of dosage, elimination, rational therapeutic considerations, individual adaptation of procedures—Comparative values of certain methods—Sceleth's method—Dercum's method—Riverside Hospital method—Effect of albumen and venesection in detoxicating dogs—Wholey's method—Methods of Dupouy, Wuth, Mignard, Römer, David, Krauss, Rojas and Belbe—Narcosan treatment—British Departmental Committee on Mor-

Page

phine and Heroin Addiction—Narcosan compared with abrupt withdrawal, Johnson—Kolb—Vegetable protein treatment—Résumé.

Chapter X—CONTROL—INTERNATIONAL 629

Shanghai Conference—Countries represented—Early treaties with Siam and China—Treaty with Japan—Philippines Opium Commission—Wright's letter to the President—Resolutions of commission—Response to U. S. Circular—Report of American delegates—Comment on Hague Opium Convention of 1912——Powers signing the convention—Resolution presented—Countries not signing the convention—Final Protocol of Second Opium Conference—Exports from U. S. prohibited—Third International Opium Conference—Instruction to American delegates—Report of American delegates—Final Protocol of Third International Opium Conference—Peace Conference articles on Opium Conventions—Article 23 of the covenant of the League of Nations—Resolution of League—Advisory Committee on Traffic in Opium—Resolutions of Council—Requirements of countries—Reports and resolutions of Council and various committees—Action of Third Assembly on import and export certificate system—Fourth session of Advisory Committee—Abuse defined—Causes of abuse—Determination of abuse—Amounts required for medical and scientific purposes—Prevention of abuse—Hearings and Resolutions of Committee on Foreign Affairs—Resolution as passed by Senate and House of Representatives—American Delegation to Fifth Session of Advisory Committee 1923—American proposals—Resolutions of Advisory Committee—Reservations of Indian Government—Resolutions of Fourth Assembly, Sept. 1923—Extracts from minutes of Assembly—Resolutions of Council Dec. 1923—Sixth Session Aug. 1924—Recommendations of Conference—Resolutions of meetings of Mixed Sub-Committee—Second International Opium Conference Nov. 1924.

Chapter XI—CONTROL (continued)—NATIONAL 745

Act of 1909—Treaty of 1880—Tariff laws—Results of Act of 1909—Bills presented but not passed—Harrison Act and Amendments—Regulations of Secretary of the Treasury—Treasury decisions—Court decisions —Discussion of law and regulations—Jones-Miller Act—Federal Narcotics Control Board—Amendment of June 7, 1924—Creation of Bureau and Commissioner of Prohibition—Control of narcotics vested in Prohibition Bureau—Estimates for medical needs, discussion—Proper method for determining needs—Maryland study—Studies of Committee on Drug Addictions—Discussions—Needs based on sales by manufacturers, discussion.

Chapter XII—CONTROL (continued)—STATE 807

Historical—Drugs included—Exceptions—Channels of distribution—Records required—Smoking opium—First anti-opium laws—Special provisions—Provision for addicts—Registration of addicts—Definition of

Page

addicts—Enforcing agency—Penalties—Legislation in New York State—Whitney Hearings—Department of narcotic drug control—Provisions of Whitney Law—Regulations under law—Annual report of commissioner—New Orleans clinic—Objects of dispensary—Treatment—Legal status of clinic.

CHAPTER XIII—CONTROL (continued)—MUNICIPAL 849

Jacksonville clinic—New York City clinic—Hospital treatment—Health department regulations New York City—Comments of Judge Collins—Court cases of addiction—Ages—Numbers committed—Sex distribution of court cases—Report to New York State Association of Magistrates—Present conditions—Shreveport clinic—Historical sketch—The dispensary—Results—Resolutions of medical society—Los Angeles clinic—Reports of director—List of clinics.

CHAPTER XIV—CONTROL (continued)—MISCELLANEOUS SUGGESTIONS 877

Opinions of committees and individuals taken from current literature from 1915 to 1927—Résumé.

APPENDICES 929

BIBLIOGRAPHY 997

INDEX 1015

PREFACE

The Committee on Drug Addictions is a group consisting of the following individuals: Katharine Bement Davis, Ph.D., General Secretary, Bureau of Social Hygiene, Chairman; Stanley Cobb, M.D., Professor of Neuropathology, Harvard University Medical School; Lafayette B. Mendel, Ph.D., Sc.D., Professor of Physiological Chemistry, Yale University; A. N. Richards, Ph.D. Sc.D., Professor of Pharmacology, University of Pennsylvania; Willard S. Richardson, Secretary, Laura Spelman Rockefeller Memorial; William F. Snow, M.D., General Director, American Social Hygiene Association; George B. Wallace, M.D., Professor of Pharmacology, New York University and Bellevue Hospital Medical College.

The studies pursued by the Committee have been carried on by Charles E. Terry, M.D., Executive, and Mildred Pellens, Associate Executive.

The Committee was organized in 1921 as a result of several conferences of its members and a few other individuals who came together to discuss what commonly is termed the narcotic drug problem. These conferences in themselves were fairly typical of the differences in existing opinions and attitudes, inasmuch as there developed among the members a number of apparently contradictory conceptions of the problem in general, its causes, its nature, and the procedures best suited to its ultimate solution. It seemed apparent also that in spite of all efforts at solution there existed a major problem and much confusion in the minds of those officially, professionally or otherwise dealing with it. The existence of the many contradictory theories as to needed remedial procedures appeared to be due to pronounced disagreement as to the actual nature of the problem. The Committee was formed, therefore, with a clear appreciation of the existence of a complex problem arising out of the chronic use of opium.

It was decided that the first object to be sought in an intelligent approach was a determination of whether in opium addiction there existed a problem important enough to warrant the institution of constructive efforts directed at solution. Certain questions suggested themselves, which, could they be answered, would assist materially in carrying out the program of the Committee. These questions were concerned with two main lines requiring investigation, i.e., chronic opium[1] intoxication as a social problem and as an individual problem. It readily can be seen that satisfactory answers to the following questions would enable the Committee to accomplish its purpose:

1. a. What is the extent of the chronic use of opium and its derivatives?
   b. What causative factors were involved?
2. What is the etiology of chronic opium intoxication?
3. What is the nature of chronic opium intoxication?
4. How should this condition be treated?
5. How may the problem of chronic opium intoxication be solved?

As a first step it was decided that a review of the literature dealing with the subject was the most practical procedure and that, while other promising sources of information should be investigated, the written work of those who had studied the condition in any of its phases probably would offer the most valuable material.

The study outlined was completed and a detailed report of the material reviewed was submitted to the Committee, who at several meetings considered its significance as an indication of the present status of the opium problem. As a result a program for further work has been prepared and the preliminary steps for its execution have been taken, as the Committee has concluded that the problem involved is deserving of its best efforts at solution along several lines.

As one activity the presentation to the public in some useful form of the material covered in its study has seemed desirable.

In the preparation of the present volume, the material originally submitted to the Committee on Drug Addictions in the report of the executives has been condensed considerably. It is felt that the chief value of this publication will be to stimulate a wider general and scientific interest in the problem, to acquaint those potentially or actually interested with some idea of the different phases of the problem and of various theories which so far have been elaborated, to suggest through its review of existing records other and broader fields for study and research, and to supply those who may wish to undertake intensive studies with a useful bibliography.

---

[1] By common consent of the Committee, it was decided to confine the study to the chronic use of opium and its derivatives, in the belief that the habitual use of cocain and other so-called addiction-forming drugs offered a problem differing materially in certain phases from that comprised in chronic opium intoxication.

INTRODUCTION

The problem of chronic opium[1] intoxication, as occidental countries have come to know it of recent years, is so extremely complex and far-reaching, so intimately interwoven with public health, commerce and trade, and social customs, and has been evolved so insidiously that we may well ask if the use of opium ever was confined to its sole valuable function, namely, that of a therapeutic agent. So very complex, indeed, is the problem that it would be impossible and needless, at the present time, to attempt to delineate it in its entirety. The last thirty years, however, and especially the last ten or fifteen years, have brought one phase or another with ever-increasing frequency to public, scientific, and official notice.

Among the western nations, the United States seems to have acquired the reputation,—whether deservedly or not need not be considered here—of being more widely and harmfully affected than any other. Certainly, in this country there has been much more interest evinced in control measures both of an international and national character than elsewhere. Whether the problem is really greater in the United States than in other countries or whether, perhaps, the question simply has been more agitated here by virtue of a better appreciation of its extent are matters for speculation. Certainly, our news agencies have not minimized the importance of the problem or lessened the public's interest in it and today, on almost every hand, individuals, local organizations, scientific bodies, and legislative groups have become aroused to what is considered generally a health and social peril of magnitude.

Unfortunately, among those who have become interested from a professional, legislative, administrative, sociologic, commercial, or other point of view, there has been an almost continuous controversy as to practically every phase of the narcotic situation, with the result that all the way from the causes on through the development, course, and treatment of the condition, to say nothing of its underlying nature and methods of control, there has been a lack of unanimity of opinion. These differences have been expressed in reports of scientific research, textbooks on medicine, legislative acts, judicial opinions, and administrative procedures,—in general, in the opinions and efforts of all who, from one motive or another, have appeared to seek a solution.

---

[1] Opium as here employed includes all opium preparations and derivatives as morphin, heroin, codein, laudanum, etc.

In view of the importance of the problem it is astonishing that little specific information on even the main features of this condition is available in any one place. In general, students and writers appear to have approached the subject from only a limited experience—with too meagre a basis of fact—and to have emphasized unduly one or another feature to the total exclusion of related data. This tendency quite naturally may have led the more or less casual reader as well as possibly legislators, administrators, and others officially or professionally connected with the individuals involved, to prejudicial attitudes and unwarranted generalizations.

The actual work involved in accomplishing the objects of the Committee consisted in the collection of all available useful data from:

1. A review of the medical literature as contained in standard textbooks on practice, nervous and mental diseases, therapeutics, materia medica and pharmacology, as well as in treatises, monographs, journal articles, theses, and special reports for a period covering approximately fifty years of medical progress.

2. A review of lay work, reports of investigations, individual studies, and the findings of official commissions.

3. A review and digest of the international, national, and state covenants and laws and the regulations relating thereto.

4. Addressing questionnaires to—
    Medical heads of national, state, county and municipal penal and correctional institutions of the United States
    Neurologists and psychiatrists
    Medical heads of private hospitals for nervous and mental cases and those treating this condition
    Medical heads of state, county and city hospitals for the insane
    Internists and general practitioners including
        Members of special societies on pediatrics and internal medicine
            " " Association of American Physicians
            " " American Surgical Association
            " " American Association of Pathologists and Bacteriologists
            " " American Climatological and Clinical Association
            " " American Medical Editors Association
        Individuals suggested by state health officers as being interested in the problem

Authors on materia medica, therapeutics, practice of medicine, etc.
Authors of books, general articles, etc., covering the subject
Municipal health officers and state health officers
Chiefs of police

5. Addressing questionnaires to heads of clinics and others whose professional connections had supplied them with special data relating to certain particular phases of the problem

in the belief that such a procedure would supply a fairly composite picture of the professional and official opinion and attitude of the day as to the medical and sociologic aspects of the problem.

Contrary possibly to the general belief, the bibliography on the subject is very extensive;—that compiled for the Committee numbers more than six thousand items. Obviously this bibliography contains much valueless material and much which is almost wholly repetition under different authorships. Therefore, in the prosecution of the review of this material it seemed desirable to select that which would best represent existing knowledge and portray the views commonly expressed. This was done and in the selection the following matters were considered;—the eminence of the authors in their respective fields, their known interest and experience in the problem under consideration, their influence in shaping medical and lay opinion, their official or semi-official connections, the employment of their writings for teaching purposes, the original or unusual attitudes held, their connection with public or private institutions of repute and their known efforts in research.

In any process of selection, no matter how great care is exercised, omissions of more or less important material are always possible. The whole of the bibliography was not covered, but every reasonable effort was made to include all valuable material and the report submitted contains practically everything of a nature to assist in a determination of the present status of our knowledge of the subject.

Naturally greater space is given to more recent works, though it was deemed wise to include a few individual pieces dating as far back as 1850 or 1860, as the background so obtained assists very materially in understanding and evaluating more recent developments. For a really complete appreciation of certain of the phases of the opium problem as it exists today, a far more comprehensive historical review would be necessary as without it certain sociologic, economic, and political aspects may not be made wholly clear; but for the purposes of the Committee it seemed advisable to omit any comprehensive consideration of such matters as do not directly concern the handling of the problem as it exists in the United States today.

Whatever omissions may exist, it is believed that a sufficient portion of the best thought of the day on every important aspect of the problem has been covered to enable any one interested, without depending on the unsupported statement of single individuals, groups, or schools of thought and without further prolonged search, intelligently to draw conclusions as to the nature and needs of the situation, at least in so far as modern recorded thought will enable him so to do. The quotations are sufficiently extensive to convey accurate pictures and the material has been selected with the object of giving an eminently fair picture of the various theories current within recent years.

It should be noted that where not otherwise stated the quotations from foreign authors are our translations of the originals.

One further matter requires consideration, namely, the terminology employed. As elsewhere, here also controversial subjects are involved, for different writers have used terms and definitions which in themselves have indicated particular attitudes toward the nature of the problem. Thus habit, craving, appetite, mania, addiction, addiction-disease, all may be interpreted significantly if desired by those using or reading them. We have tried to select some name for the condition of chronic opium-using that would not carry a partisan, restricted or incomplete implication as far as the nature of the condition is concerned. The phrase *chronic opium intoxication* seems to fulfill this purpose better than any other but it has the disadvantage of length and is at times an awkward expression. We decided, therefore, not to restrict ourselves to any one term, but to employ whichever of those in common use today seemed best suited to the individual need. We would emphasize the fact, however, that adherence to no school of thought or theory of the nature of the condition under consideration is to be inferred from the terminology employed in the present volume.

CHAPTER I

EXTENT

The number of individuals involved is probably what first brings any problem to the attention of the public. It bears a definite relationship to control and if it is demonstrated that a problem is confined neither to a community nor to a section of the country, neither to one social group nor even to one race, but is widespread and common to all, such facts should be used as the basis for eliciting interest, for pointing out the need for remedial measures, and for framing such measures. Likewise the converse is true. A knowledge, therefore, of the extent of the problem with which we are concerned is a matter of importance and should receive early consideration.

The attempts which we have made to secure an accurate estimate of the number of chronic opium users in the United States at the present time emphasize an unusual situation. We find estimates varying all the way from a few thousand individuals to several millions. One states that one hundred thousand to two hundred thousand is the outside limit while another states that two million or more is a conservative figure. The lay press, popular magazines, and even scientific journals vary so widely in their estimates of the number of sufferers from this condition that one is justified in accepting none of them unreservedly and in analyzing afresh all available means for the determination of the actual facts.

It will be seen not only that no one is possessed of an accurate knowledge as to the exact number of individuals regularly using opium in this country today, but also that under present conditions it is impossible to obtain such a figure. There are several reasons why this is true. In the first place, the fact that opium-using in any form is regarded by the general public as alone a habit, vice, sign of weak will or dissipation undoubtedly has caused the majority of users to conceal their condition. This attitude presumably attributes to the individual either a physical or mental inferiority the concealment of which is quite natural. This factor applied before the problem ever became a matter for official and legislative action and undoubtedly became intensified when it was taken up officially and the individuals desirous of solving it made their views the basis of propaganda for control. With the advent of prohibitory legislation and the consequent fear of legal involvement, it is natural that even greater efforts were made by individuals affected to conceal their condition.

Quite aside from this individual point of view is the fact that only in cases where large doses of the drug are being consumed can casual observation or even a fairly careful examination determine the existence of the condition. There is a popular belief extant that practically anyone can detect the so-called "dope fiend," that he is a miserable, emaciated, furtive individual with pinpoint pupils, trembling hands, sallow complexion and characterized by a varied group of moral attributes, needing only to be observed to render identification of the condition complete. As a matter of fact not even one of these alleged characteristics need be present and it is safe to say that in many cases only one or another of them exists and by no means would suffice to give the ordinary observer an idea of the true situation. It has been reported that for many years husbands and wives, to say nothing of other members of a family, have lived in complete ignorance of the existence of this condition in one or the other and that quite possibly the average physician, unaccustomed to dealing with the condition, might have difficulty in determining its existence.

In view of what has been said it would seem quite evident that there is no accurate knowledge as to the exact number of chronic opium users in the country today, as it is apparent that, if the condition is considered a physical, mental, or moral stigma and if it is possible to conceal it from any but the most scrutinizing examination, unknown cases inevitably must exist. This may be expected to continue as long as the present attitude toward the user of these drugs exists with the social and economic damage resulting from exposure, and the illicit traffic offers a means of supply. That the illicit traffic exists to a very marked degree we know; to suppose that the dangers of disclosure are not appreciated by individual sufferers would be to consider them lacking in ordinary intelligence. However, in spite of the obvious difficulties in the way of an accurate determination of the number of cases of chronic opium intoxication, startling statements constantly are being made.

Although it is apparent that under present conditions the difficulties in the way of arriving at exact knowledge or even an estimate known to approach the number of opium users in the United States are insurmountable, on a superficial examination there would appear to be two methods available for attaining at least a minimal figure. As it is common knowledge that opium is not produced in this country and that therefore all opium used must be imported, it is possible to secure through the proper Government bureaus the quantity of opium legitimately imported. By suitable calculations apparently it should be possible to arrive at the total number of users, excluding those supplied by the illicit traffic. Theoretically this could be accomplished by subtracting from the amount imported for a given period the amount exported and the amount used for therapeutic purposes not connected with chronic opium intoxication and dividing the resulting figure by the average amount consumed by the chronic user for that period. This method has been used by some authors, but there are several factors which vitiate the totals arrived at. First, some writers have neglected to distinguish between general importation figures and the figures dealing with importations for consumption.[1] This at once makes for very different totals as will be seen when it is stated that, for the period of ten years 1911-1920 inclusive, these amounts differed by about 400,000 pounds of opium.

Another source of error enters in any attempt to allow for the amount of opium and its derivatives employed for therapeutic purposes not connected with chronic opium intoxication. The estimates as to the proportion of imported drug required for such purposes have varied very widely and obviously where such large figures are dealt with the resulting estimates vary considerably. These allowances always seem to have been reached either in an arbitrary fashion or upon a basis of incomplete facts.

Further so far as we know there has been made no study of a sufficiently large and representative number of individual cases under suitable conditions to permit of any definite statement as to an average daily dose. For instance, it is well known that certain cases continue for years on one or two grains or even a fraction of a grain daily while others take such almost unbelievable doses as eighty to one hundred or more grains a day. Also, among a certain type, the amount stated as habitually consumed by an individual may include the ration of one or more other individuals unknown to the investigator.

---

[1] "General imports" embrace imported articles entered at the customs houses for immediate consumption and imported articles entered for warehouse. "Imports entered for consumption" embrace imported articles entered for immediate consumption and imported articles withdrawn from warehouse for consumption.

As far as we know then there are two obstacles to the determination through importation figures of a minimal figure for the number of chronic opium users in this country at the present time,—(1) the fact that the so-called "legitimate therapeutic needs" are unknown and (2) the wholly speculative nature of the "average dose." In view of these facts, all estimates as to the extent of this condition based on importation figures however used are potentially fallacious to such a great degree as to be practically valueless.

The second method of determination is the employment of some means for the taking of a census of opium users in a given locality and adjusting it to the population of the country as a whole. Aside from the fact that it would not include those users who, by reason of their desire for concealment and consequent dependence on illicit traffic for supply, could not be recorded,[2] such a survey undoubtedly would possess a value not found in estimates based on importation figures in an attempt to reach a minimal figure, inasmuch as it would be definite and positive as far as it went. Of course, there is possibility of error to a greater or less degree in this method. The floating population, for example, cannot be disregarded, yet this is a source of error common to every method of census-taking. Further, local conditions such as population composition, climate, race distribution, occupation, etc., are influencing factors which tend to lessen the value of the individual surveys as applied to the country as a whole. Unfortunately, there have not been enough of these surveys made in various sections to determine by comparison the degree to which these factors operate. In what follows, the surveys which we have reviewed and which represent investigations made in different localities at different periods will be analyzed and the features which tend to vitiate their application to the country as a whole, for the period in which they were made, will be pointed out.

Before examining the first definite figures of which we have knowledge, contained in a survey reported by O. Marshall in the Annual

---

[2] This factor does not enter into the early surveys which were carried on when illicit traffic was unknown or practically negligible.

Report of the Michigan State Department of Health of 1878, it will be interesting to quote from some of the earliest authors who refer to the extent of chronic opium intoxication in this country. Their statements, however inexact, at least show that the problem is by no means one of recent development but the result, as we know it today, of a continuous growth probably since Colonial days. What effect the war of the American Revolution and that of 1812 had upon its spread we have not seen indicated in any record we have consulted, but that the Civil War gave it a considerable impetus seems definitely established.

Fitzhugh Ludlow—1867.[3]

> "The habit is gaining fearful ground among our professional men, the operatives in our mills, our weary serving women, our fagged clerks, our former liquor drunkards, our very day laborers, who a generation ago took gin. All our classes from the highest to the lowest are yearly increasing their consumption of the drug."

Horace Day—1868.[4]

> "The number of confirmed opium-eaters in the United States is large, not less, judging from the testimony of druggists in all parts of the country as well as from other sources, than eighty to one hundred thousand . . . The events of the last few years (Civil War) have unquestionably added greatly to their number. Maimed and shattered survivors from a hundred battlefields, diseased and disabled soldiers released from hostile prisons, anguished and hopeless wives and mothers, made so by the slaughter of those who were dearest to them, have found, many of them, temporary relief from their sufferings in opium."

Alonzo Calkins—1871.[5]

Calkins calls attention to the increased use of opium in this country from the year 1840. Basing his computations on the importations of opium and the population figures for those years, he reaches the following ratios of advance:

On Opium	On Population
1840-1850—336 : 100	130 : 100
1850-1860—134 : 100	135 : 100
1860-1867—140 : 100	120 : 100
1840-1867—650 : 100	210 : 100

He gives in some detail the method by which he reaches these figures which include "a comparison of opinions given by eighteen prominent apothecaries of New York City."

---

[3] Ludlow, Fitzhugh—Harper's Magazine. August, 1867.

[4] Day, Horace—The Opium Habit. 1868.

[5] Calkins, A.—Opium and the opium appetite. Philadelphia, 1871.

"Such statistics," he asserts, "fully presented bear no equivocal interpretation."

Independent and collateral evidences, he believes, show that "opium-mania, far from being restricted . . . to our cities . . . is fast pervading the country-populations."

In the evidence he presents he quotes the following:

> "*Thus addresses* the writer, a physician and druggist of a New England city, Dr. S. S.: 'In this town I began business twenty years since. The population then at 10,000 has increased only inconsiderably, but my sales have advanced from 50 pounds of opium the first year to 300 pounds now; and of laudanum four times upon what was formerly required. About 50 regular purchasers come to my shop, and as many more, perhaps, are divided among the other three apothecaries in the place. Some country dealers also have their quotas of dependents.' Such is no solitary record.
>
> "*In the Portland Press,* 1868, a correspondent sounds the alarm-note in these words: 'Very few of our people are aware how many habitual consumers of opium among us a careful scrutiny would disclose. In the little village of Auburn (of the neighborhood) at least fifty such (as counted up by a resident apothecary) regularly purchase their supplies hereabouts; and the country grocers, too, not a few of them, find occasion for keeping themselves supplied with a stock.' Corroborative accounts come in from New Jersey and Indiana, from Boston at one extreme and from St. Louis at another, and from the impoverished South as well. In the Mississippi Valley particularly the use of stimuli of every name is fearfully on the increase (Pitcher, Comstock)."

F. E. Oliver—1871.

In the third Annual Report of the State Board of Health, Massachusetts, for the year 1871, there appears a chapter on the use and abuse of opium written by this author. The writer addressed the following questions to the physicians of Massachusetts:

1. Are preparations of opium used by the people except for the relief of pain?
2. We would like to know whether the injurious use of opium has increased of late years, and if so, the causes of such increase?

Unfortunately, these questions were not so framed as to elicit the information which the author desired to obtain and, as he himself states, the data secured are most incomplete although suggestive. Less than one-half of the physicians addressed were heard from, representing a little more than one-third of the physicians of the state. In all 125 physicians replied, 40 of these stating in answer to the first question that they knew of no case of opium eating. The remaining 85 stated that the drug was used to a greater or less extent in their respective circuits. In many of the smaller towns where the "habit" existed, the number of users was reported where it could be ascertained, while in the returns from others such terms as "few," "many" and "several" alone were given. In others again no mention was made of numbers, so that the author was not able to arrive at anything like an accurate computation. From the fragmentary data so obtained the author states that the inference is unavoidable that the "opium habit" is more or less prevalent in many parts of the state and while it is impossible to estimate it the number of users must be very considerable.

The writer further gives the following extract from a letter received from Mr. S. Dana Hayes, one of the State Assayers:

> " 'In reply to your inquiries, it is my opinion that the consumption of opium in Massachusetts and New England is increasing more rapidly in proportion than the population. There are so many channels through which the drug may be brought into the State, that I suppose it would be almost impossible to determine how much foreign opium is used here; but it may easily be shown that the home production increases every year. Opium has been recently made from white poppies, cultivated for the purpose, in Vermont, New Hampshire and Connecticut, the annual production being estimated by hundreds of pounds, and this has generally been absorbed in the communities where it is made. It has also been brought here from Florida and Louisiana, while comparatively large quantities are regularly sent east from California and Arizona, where its cultivation is becoming an important branch of industry, ten acres of poppies being said to yield, in Arizona, twelve hundred pounds of opium.' "

* * * * *

> " 'That which is not used where it is produced, including the shipments from California and the West, together with inferior and damaged parcels of foreign opium received and condemned at this port, is sent to Philadelphia, where it is converted into morphia and its salts, and is thus distributed through the country.' "[6]

In his letter Hayes comments further on the use of opium and morphin in family remedies such as cough mixtures and liniments and in the dangerous so-called "cures" or "Relief for Opium-Eaters" preparations.

---

[6] D. M. R. Culbreth in his "Materia Medica and Pharmacology", 3rd edition, 1903, states:

"During the Civil War opium was cultivated in Virginia, Tennessee, South Carolina, Georgia, being planted in September and collected in May."

In the 6th edition of the same work the author states that this opium was of high narcotic content.

Oliver also quotes extracts from letters replying to his question as to the increase in the use of opium, some of which are reproduced below:

"Clarksburg—'I think it on the increase, because doctors prescribe it more indiscriminately now than formerly, thus establishing the habit with the patient.'

Eastham—'I think the use of opium has slightly increased, mostly among females.'

Swampscott—'The use of opium in its various forms has materially increased within the last ten years.'

Westfield—'I have reason to believe this practice exceedingly common among certain classes of people, who crave the effect of a stimulant, but will not risk their reputation for temperance by taking alcoholic beverages.'

Worcester—'I have talked with some of our most intelligent apothecaries, who tell me that the use of opium has greatly increased, especially among women. The reasons which one gave are these: The doctors are prescribing it more to their patients, and thus the habit is acquired. There is also the desire for some form of stimulant. Alcoholic stimulants being prohibited, many have resorted to the use of opium.'

Another gave it as his opinion that 'the use of opium in its various preparations is increasing among the people as a stimulant, and is now being used to an alarming extent. I believe this to be due largely to the unpopularity and restricted use of alcoholic liquors. I believe there is a natural craving for some artificial stimulant with almost every human being, which is greatly increased by the cares and perplexities of life, and therefore is more apparent as age advances. This desire should be satisfied by the milder and least injurious drinks, as beer, light wines, etc.'

Another states: 'I think opium and its preparation are used to a considerable extent as stimulants, and am inclined to the opinion that such use is increasing and that such increase is due, in some degree, to the excitements, suffering and mental disquietude resulting from the late war.'

Boston—Among 20 or 30 druggists consulted there was a diversity of opinion, many of them not selling opium without a physician's order. The following statements are among the most important:

'Believes the habit of opium eating diminishing, as he has fewer calls than formerly.'

'Has one customer who buys half an ounce at a time. The number of calls is less than formerly. Has observed that veteran soldiers who contracted the habit in army hospitals are still addicted to opium.'

'In the experience of twenty-five years has observed no decided increase in the habit of opium eating. Recognizes the correlation in the abuse of opium and of alcohol. The opium habit frequently begins in the use of opium medicinally. Veteran soldiers, as a class, are addicted to it . . . '

'Thinks the abuse is not uncommon in the community but that it is less in Boston than elsewhere. Would look for it rather among professional men than among the poorer classes.'

'From his own experiences, believes that the habit of opium eating has increased within the last five years from 50 to 75 per cent. Never sells the drug without physician's prescription but has on an average five or six daily applications for some one of its preparations. It is largely taken by prostitutes.'

'Has but one customer and that a noted temperance lecturer.'"

S. F. McFarland—1877.[7]

"If cases of opium inebriety occur as frequently in the private practice of other physicians as they have in my own, it is coming to be a serious matter, and a few words of caution, against the indiscriminate use of so active a drug, may be pardonable.

"Since the introduction of the hypodermic syringe, especially, there has been a noticeable increase in the frequency, as well as the severity, of these cases; and I wish to enter a protest against its imprudent use, and particularly against leaving it in the hands of patients or their friends, to be used at their discretion, or even allowing them to know that they can use it, except in the greatest emergencies; for once in their possession, and used for any considerable length of time, they will seldom discontinue it, and will soon be inquiring where they can get 'one of those things'. It is certainly a most valuable instrument in the hands of the discreet practitioner, and will reach cases which nothing else will, with a certainty and promptness which is very satisfactory; but it is too potent for evil, as well, to be trusted beyond his grasp.

"By the hypodermic use of opium the habit is much more rapidly produced than by taking it into the stomach, or by any other method—a fact which should not be lost sight of."

O. Marshall—1878.[8]

Turning to a consideration of the early surveys, the one already mentioned by O. Marshall deserves first consideration, as it was the earliest of which we have knowledge. While these figures are obviously quite incomplete, they represent at least a minimal extent and apparently can be depended upon as comprising positive information as far as they go. For these reasons they are of great importance to us today in seeking to arrive at a true conception, first, of the probable influence of factors other than illicit traffic and, second, of their possible relationship to conditions of today.

Marshall begins his report with the following paragraph:

"At a meeting of the State Board of Health in January, 1877, by a written communication, I called its attention to the large number of opium-eaters in the vicinity of North Lansing, giving many particulars relating to the opium

---

[7] McFarland, S. F.—Opium inebriety and the hypodermic syringe. Trans. New York State Medical Society, 1877.

[8] Marshall, O.—The opium habit in Michigan. Annual Report Michigan State Board of Health. 1878.

> habit as it exists here. In complying with the request of the Board to prepare an article for publication, I have extended the investigation to other parts of the State, the result of which investigation is here given."

From further observations the author realizes how impossible it is to obtain complete and perfectly reliable information concerning this condition. He states:

> "Those best acquainted with its extent are the physician and druggist. As a rule, the physician, although originally responsible for many of the cases in his vicinity, is only aware of them through his business relation with the druggist. The latter, from whom the drug is obtained, from the fear of loss of trade, or, as some of them term it, a violation of confidential business, are often unwilling to furnish any information with regard to it."

Marshall sent two hundred circulars to prominent physicians throughout the state asking for information in regard to the opium "habit" in their localities and enclosing a postal card with printed form for report of the number of men and women using opium and morphin in each place. Marshall took care to eliminate duplication of cases by addressing only one physician in each locality and where reports from a physician included figures from two or more druggists the lists were compared and repeaters eliminated. To those, ninety-six replies were received giving the number of morphin and opium users in ninety-six cities, villages, and townships of the state. He says in this connection:

> "From the supposed impossibility of getting reliable information of the numbers in the larger cities, no circulars were sent to Detroit, Grand Rapids or East Saginaw; and probably from this cause no answers were received from many of the larger cities of the State where circulars were sent."

The majority of the reports received by him include only those persons with whom the physician personally was acquainted. This, he points out, resulted in obtaining less complete information than had the druggists themselves been addressed. This, he says, is noticeable in the reports from two neighboring cities, one of which gives the large number of one hundred sixteen, which number was obtained after considerable effort by particular request, while the other reports only one case. A druggist, however, formerly in business in the latter city estimated the number of opium users in that city at not less than sixty. From such facts as these Marshall comes to the conclusion that only the minimal number was obtained and that the actual number was probably greater in many instances.

We are including the complete table given in Marshall's report. It is of peculiar interest because of the fact that urban, rural and semi-rural communities were included and that the larger cities of the state, in which the underworld and vicious element naturally would be supposed to exist in the greatest degree, were absent. The assumption therefore is that, whatever the cause for the original use of the drug, the influence of vicious association was relatively negligible. It is significant that throughout his whole report no mention is made of illicit traffic or of any source of supply other than that through physician and druggist.

Marshall summarizes his findings as follows:

> "The total number of opium eaters reported in the places given is 1313; of these 803 are females, and 510 are males . . . The population of the cities and villages including the townships in which they are situated, according to the State census of 1874, was 225,633. The population of the whole State at the same time was 1,334,031. If the number of opium eaters, including morphine eaters, in proportion to the population in the places given holds good for the entire State, the total number of opium eaters, all classes, in the State would be 7,763. Taking every degree of the habit into consideration, this estimate of the number is probably not too large."

The smallest community from which figures were obtained had a population of but 315, the largest a population of 10,235, the average population of the 96 towns being 2350. In other words, whatever the prevalence of the use of narcotic drugs obtained by Marshall was, his facts were derived from small hamlets and towns which scarcely could be dignified by the name of city even in the time in which he wrote. These communities covered every section of the state and presumably gave a true picture of it as a whole. Obviously, as already stated, underworld influences such as prostitution, gambling, etc., largely can be eliminated. At the time of this investigation communication was much more difficult and less rapid than it is today; news was not so widely disseminated and in an area of such an extent as that of the state of Michigan, one must conclude that a situation of this nature was caused by factors of common occurrence, by influences shared alike by all communities rather than by artificial or unusual influences operating in selected localities. If, therefore, we find that Marshall's figures were based on representative conditions common to all sections of the state, it is reasonable to assume that they may be applied also to the country as a whole. We may not assume, for instance, that the

TABLE I

Showing the number of Opium and Morphine Eaters, with the Number of Each Sex, Reported in 96 Cities, Villages and Townships of the State, with the Population of Each Place, Including the Township in which it is Situated, according to the State Census of 1874.

City, village or township	County	Population including township 1874	Opium eaters			Morphine eaters			Total opium and morphine eaters
			Males	Females	Total	Males	Females	Total	
Adrian	Lenawee	10,235	14	25	39	33	44	77	116
Albion	Calhoun	2,614	7	9	16	4	19	23	39
Allegan	Allegan	3,718	2	1	3	1	4	5	8
Alpena	Alpena	3,964	2	4	6	0	1	1	7
Alton	Kent	1,240	0	0	0	0	0	0	0
Baltimore	Barry	1,216	1	1	2	0	0	0	2
Benton Harbor	Berrien	2,525	4	5	9	0	5	5	14
Bingham	Huron	664	0	0	0	0	1	1	1
Blissfield	Lenawee	2,048	4	8	12	1	1	2	14
Brighton	Livington	1,737	0	2	2	6	6	12	14
Brooklyn	Jackson	1,596	1	2	3	1	5	6	9
Buchanan	Berrien	2,880	0	0	0	3	4	7	7
Burlington	Calhoun	1,524	2	5	7	1	1	2	9
Calumet	Houghton	5,219	0	0	0	0	0	0	0
Cannonsburg	Kent	1,205	1	2	3	0	1	1	4
Cassopolis	Cass	1,814	0	1	1	1	4	5	6
Charlotte	Eaton	3,644	3	4	7	2	5	7	14
Climax	Kalamazoo	1,400	2	1	3	0	4	4	7
Clinton	Lenawee	1,437	1	0	1	0	5	5	6
Coldwater	Branch	5,605	8	9	17	10	10	20	37
Columbiaville	Lapeer	1,308	4	10	14	0	1	1	15
Corunna	Shiawassee	2,353	6	0	6	3	7	10	16
Dayton	Berrien	1,361	0	1	1	1	3	4	5
DeWitt	Clinton	1,410	5	5	10	1	2	3	13
Eaton Rapids	Eaton	2,220	1	1	2	6	10	16	18
Elsie	Clinton	1,567	2	1	3	0	2	2	5
Flat Rock	Wayne	2,490	1	2	3	0	1	1	4
Fowlerville	Livingston	2,813	6	6	12	2	4	6	18
Galesburg	Kalamazoo	1,974	2	2	4	2	8	10	14
Gilead	Branch	762	0	0	0	0	1	1	1
Grass Lake	Jackson	1,757	4	5	9	3	6	9	18
Greenville	Montcalm	3,140	2	3	5	8	10	18	23
Hadley	Lapeer	1,504	0	2	2	0	0	0	2
Hanover	Jackson	1,397	2	1	3	0	1	1	4
Hart	Oceana	1,082	0	2	2	1	0	1	3
Hillsdale	Hillsdale	4,189	10	8	18	11	9	20	38
Holly	Oakland	2,507	4	5	9	4	10	14	23
Homer	Calhoun	1,772	4	0	4	0	5	5	9
Howell	Livingston	2,813	7	8	15	3	7	10	25
Hubbardston	Ionia	1,083	2	3	5	0	1	1	6
Hudson	Lenawee	9,927	6	10	16	6	10	16	32
Huron	Huron	437	2	1	3	0	0	0	3
Ionia	Ionia	4,747	4	2	6	4	8	12	18
Laingsburg	Shiawassee	1,312	1	3	4	0	2	2	6
Lansing	Ingham	8,316	25	24	49	18	24	42	91
Lapeer	Lapeer	4,038	4	6	10	2	7	9	19
Leroy	Ingham	1,205	1	3	4	0	0	0	4
Little Prairie Ronde	Cass	1,445	2	1	3	1	2	3	6
Lowell	Kent	2,826	3	8	11	4	3	7	18
Manchester	Washtenaw	2,509	2	3	5	4	5	9	14
Maple Rapids	Clinton	1,513	2	1	3	0	5	5	8
Marshall	Calhoun	5,576	8	22	30	9	10	19	49
Mattawan	Van Buren	2,209	2	3	5	0	1	1	6
Mendon	St. Joseph	1,748	0	0	0	0	4	4	4
Milford	Oakland	2,069	0	2	2	0	0	0	2
Monroe	Monroe	6,709	0	0	0	0	1	1	1
Muir	Ionia	2,843	1	0	1	0	8	8	9
Napoleon	Jackson	1,120	1	0	1	0	2	2	3
Niles	Berrien	6,387	17	13	30	4	12	16	46
North Adams	Hillsdale	2,857	5	4	9	16	3	19	28
Orion	Oakland	1,186	2	2	4	0	0	0	4
Ortonville	Oakland	1,170	4	3	7	1	2	3	10
Otisville	Genesee	1,365	3	1	4	0	1	1	5
Otsego	Allegan	2,118	5	8	13	6	12	18	31

Table continued on next page

TABLE I* (continued)

Showing the number of Opium and Morphine Eaters, with the Number of Each Sex, Reported in 96 Cities, Villages and Townships of the State, with the Population of Each Place, Including the Township in which it is Situated, according to the State Census of 1874.

City, village or township	County	Population including township, 1874	Opium eaters			Morphine eaters			Total opium and morphine eaters
			Males	Females	Total	Males	Females	Total	
Ovid	Clinton	2,533	2	6	8	1	7	8	16
Owosso	Shiawassee	3,498	2	4	6	3	6	9	15
Oxford	Oakland	1,342	1	3	4	1	2	3	7
Palo	Ionia	1,324	0	0	0	1	1	2	2
Peck	Sanilac	1,185	0	0	0	0	0	0	0
Petersburg	Monroe	1,648	1	1	2	0	1	1	3
Petoskey	Emmet	315	4	1	5	0	1	1	6
Pinkney	Livingston	1,213	0	3	3	0	3	3	6
Plymouth	Wayne	3,009	1	1	2	0	3	3	5
Pontiac	Oakland	4,672	6	7	13	3	12	15	28
Portland	Ionia	2,596	5	9	14	9	17	26	40
Prairieville	Barry	1,168	0	0	0	0	4	4	4
Richland	Kalamazoo	1,255	0	1	1	0	0	0	1
Rockford	Kent	2,591	3	4	7	0	1	1	8
Shelby	Oceana	799	0	0	0	0	1	1	1
South Cass	Ionia	1,087	1	4	5	0	0	0	5
St. Charles	Saginaw	1,341	1	5	6	0	2	2	8
St. Joseph	St. Joseph	3,288	5	5	10	9	10	19	29
Stockbridge	Ingham	872	1	0	1	1	2	3	4
Stoneville	Marquette	1,098	0	0	0	0	0	0	0
Tecumseh	Lenawee	2,543	5	7	12	4	9	13	25
Thornville	Lapeer	1,668	0	0	0	2	3	5	5
Unadilla	Livingston	1,066	0	0	0	2	2	4	4
Union City	Branch	2,250	3	4	7	2	3	5	12
Utica	Macomb	1,581	3	4	7	2	3	5	12
Vernon	Shiawassee	1,785	1	2	3	4	6	10	13
Wacousta	Clinton	1,298	2	2	4	0	1	1	5
Walled Lake	Oakland	1,276	2	2	4	0	0	0	4
Wayne	Wayne	3,127	7	5	12	4	6	10	22
Whitehall	Muskegon	1,323	3	6	9	3	6	9	18
Williamston	Ingham	1,405	1	5	6	1	6	7	13
Wyandotte	Wayne	3,338	1	0	1	0	0	0	1
Totals		225,633	275	355	630	235	448	683	1,313

* From—"The Opium Habit in Michigan," by O. Marshall, Annual Report, Michigan State Board of Health, 1878.

distribution of painful disease, of insomnia, of nervousness, or even of certain social proclivities and curiosity was peculiar to Michigan and that in 1877 through some mischance its people, more than those of other states, were subjected to pernicious influences of this nature. Nor may we assume that the practice of medicine was conducted along widely different lines in Michigan from those elsewhere or that the druggists of Michigan were more careless in the conduct of their business, less prone to make a profitable sale or more blind to the harm resulting from this traffic than those of other states. In other words, there would seem no valid reason for not applying to the country as a whole such figures as Marshall gives us in depicting the extent of chronic opium intoxication in his state. Also the resulting estimate for the country would be a minimal figure not only because of the incompleteness of Marshall's returns but also because of the absence in Michigan of certain influences which would tend to increase the use of opium. At that time, as we know from other sources, there were operating on both the Atlantic and Pacific coasts influences that did not operate in Michigan, an inland state. On the west coast there were such influences as the maritime traffic with the Orient and the coolie labor imported for railroad and other construction undertakings, while in New England we have already seen poppy culture already was being indulged in and shipments were being made to other states.

As a preliminary to the application of Marshall's figures to the State of Michigan as a whole, three things must be borne in mind—first, the total omission of returns from the larger cities, second, the fact which he himself brings out, that information secured from the stated source, namely, physicians, was less complete than would have been information secured from druggists, and, third, the use by Marshall of population figures for the year 1874 instead of 1877.

From the ninety-six communities heard from, as we have seen, there were reported 1313 users of opium or morphin. For some unknown reason Marshall employs in his computation the state census figures of 1874 rather than an estimated figure for the year 1877 in which the survey was made. The population of Michigan, according to him, was in 1874, 1,334,031. Employing this figure he comes to the conclusion that if the number of opium and morphin users holds good for the entire state the total number in the state would be 7,763. Taking into account the natural rate of increase in population between the years 1874 and 1877, this figure would represent a slight overestimate, all other things being equal. However, this is offset by other factors such as the relative incompleteness of the information received from physicians as compared with that received from druggists and it is fair to assume that this is a minimal figure. How great the error on the side of underestimation is, we have no means of telling.

The fact that in one town, Monroe, the physician addressed reported but one case while a druggist stated that there were about sixty, is indicative possibly of a very great error in Marshall's total figure and it must be remembered that the druggists were in a much better position to know the truth than were physicians. They supplied the drugs used and as a rule, especially at the time of Marshall's investigation when counter sales were legal and a matter of common practice, physicians were called upon only by those opiate users seeking curative treatment for their condition. It is, therefore, doubtful if the medical profession at any time has been in a position to supply anything like a complete list of these cases while the druggists from the very nature of things in the past could have furnished this information.

It is probable, therefore, that Marshall's figures are very much more incomplete than even he himself believed and it is quite possible that the actual number of cases in the towns and cities of Michigan from which Marshall received his returns were several times larger than his figures indicated. Be this as it may, his total of 1313 cases represents definite and positive information indicative of the widespread use of these drugs in the State of Michigan over fifty years ago, long before the development of an illicit traffic in opium and its preparations with its resulting artificial impetus to the formation of new cases. If applied to the country as a whole for the year in question, 1874, this figure gives a total of 251,936. This is a startling figure for the period in question and yet in all probability well below the actual one and deserving of the most careful consideration on the part of those who today, with the undoubted existence of new and increasingly powerful factors at work in the stimulation of the use of these drugs, seek to become familiar with the extent of our present narcotic problem.

Further on in his report, Marshall introduces the importation figures from 1850 to 1877. From these he estimates an average importation figure for the year 1877. From information secured from drug store sales he comes to the conclusion that the average user consumes about three pounds of opium during the year. Allowing one-fifth of the total importation for "legitimate therapeutic use" and dividing the remainder by three he arrives at a figure of 93,654 as the number of users in the country as a whole. From this figure by suitable calculation he obtains for the State of Michigan about 2550 users.

Elsewhere we have pointed out some of the dangers of calculating the number of users upon such a basis as this and in Marshall's effort we have a good illustration of the fallacies that enter. If we take Marshall's figure of 2550 for the State of Michigan we obtain, as the proportion of the ninety-six towns and cities from which he received definite information as to the number of opium users, the figure of 421 or but one-third of the actual number of users positively known to exist in these ninety-six communities. It is quite evident that in calculations based on importation figures there enter very large errors which it is impossible to determine or correct. It seems, therefore, we repeat, that little or no dependence can be placed on estimates arrived at in this manner and that fragmentary as have been the various actual surveys they furnish data of far greater value for purposes of generalization.

C. W. Earle—1880.[9]

Earle made a study of the extent of the use of opium in Chicago by interviewing a number of druggists in that city. Although the figure of the number of users he obtained may not be used in a statistical analysis, his work is a distinct contribution as an indication of the prevalence of the use of the drug at the time. The following is a quotation from his report:

> "In an article entitled 'The Impending Danger,' Dr. Mattison, of Brooklyn, states that he is assured by both dealers in the crude drug and manufacturers of the alkaloids, that importation of opium is increasing rapidly every year, and that the supply may become insufficient for the demand. The question naturally suggesting itself is: What becomes of the vast amount yearly brought to our shores?"

Earle investigated fifty drug stores, asking questions as to the number of customers, their age, nativity, kind of narcotic used, quantity, etc. He reports:

> "The three divisions of the city were visited, and localities inhabited by the different classes and nationalities were thoroughly canvassed. I was greatly surprised to find that druggists on the West Side were patronized to a greater extent (excepting a few on Clark Street) than in any other part of the city. Foreign druggists (German and Scandinavian), seem to exhibit more conscientious scruples in regard to the trade than our own nationality. I learned from some of these gentlemen that in Denmark, and, if I mistake not, in Norway and Sweden, the trade is absolutely forbidden. Fifty druggists have 235 customers, or an average of nearly five to each store."

J. M. Hull—1885.

An account of Hull's findings appears in the Biennial Report of the

---

[9] Earle, C. W.—The opium habit. Chicago Med. Rev. 1880.

State Board of Health of Iowa for 1885. This Biennial Report covers a period of two years ending June 30, 1885, and it is not quite clear from his article whether the investigation was made in the latter half of 1883, during 1884 or in the first half of 1885. In using his figures, therefore, we shall choose the middle period and base our computations on the population figures of 1884.

Hull begins his report with the following:

> "Although my paper on the opium habit is brief, and but a small part of the sad story told, yet I am inclined to believe it contains some facts regarding this rapidly increasing evil that cannot fail to astonish even those who are well informed, and far more those who have given the subject little or no attention.
>
> "Opium is today a greater curse than alcohol, and justly claims a large number of helpless victims, which have not come from the ranks of reckless men and fallen women, but the majority of them are to be found among the educated and most honored and useful members of society; and as to sex, we may count out the prostitutes so much given to this vice, and still find females far ahead so far as numbers are concerned. The habit in a vast majority of cases is first formed by the unpardonable carelessness of physicians, who are often too fond of using a little syringe, or of relieving every ache and pain by the administration of an opiate."

To fifteen hundred circulars sent to druggists in the state of Iowa, requesting information on the subject, Hull received 123 replies reporting 235 users of opium in some form. Of these 86 were men and 129 women.[10] The form of drug used was morphin, 129; gum opium, 73; laudanum, 12; paregoric, 6; Dover's Powder, 3; McMunn's Elixir, 4. As to the method of using the drug he states:

> "While the drug is used less frequently by the hypodermic method than by the mouth, the former method is gaining ground. The habit may be formed about as readily one way as the other. Those who use it by the mouth as a rule make the most rapid progress, as the drug is easier taken, is free from pain, and larger than the hypodermic dose."

He states that there were about 3,000 stores in Iowa where opium was kept for sale and that if reports had come from all in the same ratio it would have shown the number of users to have been about 6,000. By actual computation on the above basis we get 5,732. Hull states, however, that his reports were mostly from the small villages, very few coming from the cities where, he states, the "habit" was far more common. He states further:

---

[10] This figure appears to be a typographical error. We believe it should be 149.

> "From reliable information which I have been able to secure from various sources, I feel safe in saying that there are in this state over 10,000 people who are constantly under the influence of an opiate and who are wholly unable by any effort of the will to break the habit or even to abstain for 72 hours."

The estimated population of continental United States for 1884 was according to the U. S. Bureau of the Census 55,379,154 and that of the State of Iowa for the same year was 1,742,084.

Using the lower figure of 5,732 obtained in the manner described above, as the actual number of users in the State of Iowa, we get 182,215 chronic users for the country as a whole for the year 1884. This must be by far an underestimate as Hull himself states that he had good reason to believe that there were over 10,000 in the state.

In considering estimates based on Hull's figure several points should be borne in mind. First, Hull does not indicate the population served by the 123 stores reporting the 235 cases. Although he does state that there were about 3,000 stores in Iowa where opium was kept, in assuming that the sales averaged the same in different stores, there is the possibility of error. Second, according to Hull's own statement most of the cases reported were from small villages with very few coming from the cities, where he states the "habit" was far more common. With the usual vicious elements of city life eliminated, one may assume that Hull's figures represent a minimal extent.

It is worthy of note that here again no mention is made of illicit traffic.

B. H. Hartwell—1888.[11]

Hartwell made a survey in the State of Massachusetts, in the report of which, unfortunately, he failed to give the population figures on which the study was based. If these figures were available it might be possible to compute the per capita consumption. Although this cannot be done, we are giving below a summary of that part of his survey dealing with extent as an interesting side-light on conditions obtaining in that period.

Hartwell states that the investigation was undertaken in accordance with the following "resolve" adopted by the Legislature of 1888:

> "Resolved, That the State Board of Health be requested to make an investigation concerning the sale and use of opium, in various forms and preparations,

---

[11] Hartwell, B. H.—The sale and Use of Opium in Massachusetts. Annual Report, Massachusetts State Board of Health, 1889.

with a view to ascertaining the extent of the evils arising therefrom; whether such use and evils are increasing, and, if so, the manner and cause thereof, and what remedies for such evils may be proposed; and to report the result of such investigation to the General Court."

Hartwell continues his report as follows:

"This resolution was presumably an outcome of the prevalent belief that the use of opium is increasing very rapidly. An exposé of the opium joints in Boston appeared in one of the leading dailies in 1885; there have been frequent allusions to the habit in other papers; a recent article, claiming to be the result of years of study of the opium habit in Boston, was published in one of our popular magazines, in which the writer says that the habit 'is increasing rapidly.' In these and numerous other ways the public has been taught to believe that the evil is widespread and extending. The large number of opium habitues which seem to be among us, the novelty of this form of stimulation, its secret character, the strong hold which it has upon its victims, the horrible results arising therefrom, especially from the habit of opium smoking,—all tend to keep the subject prominently before the people, and to magnify the evil in the public mind. To get at the facts concerning the use of opium (the term opium will include all of its preparations), as far as possible, is the object aimed at in this inquiry. This is beset with many difficulties, from the very nature of things. There can be no reliable statistics of the amount of opium used by the medical profession, the laity, or by habitues, or the proportion used by each. The most rigid inquiry into a habit as secret and as easily practised as is this form of inebriety could not be sufficiently accurate for mathematical calculation; approximation only can be attained.

"That a great deal of opium is used besides that legitimately required for the relief of pain and treatment of disease, is unquestionably true. The unwilling ness of people to bear pain, the habit of self-prescribing, the many facilities for obtaining opium and its preparations from the regular dealers as well as by means of proprietary medicines containing it, the numerous ways by which a knowledge is gained of the method of obtaining and taking the drug—all extend its use in the most dangerous manner.

"As the best means for forming an opinion of the amount of opium used, and whether or not its use is increasing, circulars were sent to many of the druggists and physicians of the State; the questions asked and a synopsis of the answers returned are given below. Some allowance must be made in considering the returns, for the reason that opium habitues, from fear of detection or a desire for secrecy, scatter their purchases as much as possible; so that a druggist may easily get an impression of an increased or decreased use of the drug, while in reality the sales are going on elsewhere or have returned after the rounds have been completed. So also the same habitual users might be seen by different physicians, and counted several times, or escape notice altogether, and thus convey a false idea of the actual number. A circular containing five questions was sent to druggists. Replies were received from about 600 druggists, representing 190 cities and towns, and embracing nearly every city and town in the State where a druggist is located. (There are about 150 towns in which no druggists reside.) About one-fourth of the answers came from Boston, the rest from other parts of that State. Many of the returned circulars contained answers to all of the questions, others to only part of them; hence the number varies in the different questions. The questions and answers were as follows:—

"1. What amounts of opium are sold by you per month, not on the advice and prescription of a physician?"

The answers numbering 512 to 541 showed the following:

(a) Crude opium, opium in pill or other solid form?
Sixty per cent. none—the remainder a few pills to 4 pounds.

(b) Liquid preparations; Tincture?
Twelve per cent. none; the remainder one gram to 32 pints; other liquid preparations none to 40 pints.

(c) Morphia and its salts, in bulk, pill or powder?
Thirty-three per cent. none; the remainder ½ gr. to 8 oz. morphia 2 to 500 morphia pills, mostly 1/8 grs.

(d) Other preparations very little.

"2. Is the demand for opium and its salts increasing? 535 answers: 85 per cent., no; 8 per cent., yes; 5 per cent., decreasing; 2 per cent., do not know."

* * * * *

"For obvious reasons, circulars were also sent to many of the physicians of the State who commenced practice before 1875. About 260 replies were received, from 100 cities and towns out of about 250 in which physicians reside. Eight questions were submitted, which with the number and character of the answers, were as follows:

"1. From your own observation, is the use of opium and its preparations increasing in the community in which you live? 225 answers: 66 per cent., no; 28 per cent., yes; 6 per cent., do not know.

"2. If such be the case, what is the probable cause of such increase; this question called for answers only from those who had answered the first question affirmatively; consequently, but 75 of a miscellaneous character were received. Twenty per cent., give the use of opium by physicians as the sole cause; 11 per cent., give this as the cause in part. Ease of obtaining opium from druggists, duplication of prescriptions containing opium, increased knowledge of its effects, excessive brain work, desire for stimulation, fast living, comprise most of the remaining answers.

"3. Are diseases calling for the use of opium increasing? 209 answers: 84 per cent., no; 16 per cent., yes."

Although he believes, as can be seen from the above, that a great deal of opium "is used besides that legitimately required for the relief of pain and the treatment of disease," on the basis of his study, Hartwell concludes that

" . . . the use of opium is not increasing in Massachusetts. In the large centres of population there may be a slight increase from year to year. It is here that excesses and crime of all kinds, if not increasing, are much more common than in less populous districts. The better knowledge of the uses and effects of the drug, by means of the greater intercommunication of the people; the many facilities for obtaining it; the general practice of writing prescriptions, followed by unrestrained reduplication of them; the excitement of business, leading to overwork and overtaxing of the mental powers,—are conditions which are favorable to the increased use of opium."

A. P. Grinnell—1900.[12]

This author made a study of the consumption of drugs in the State of Vermont and while he made no attempt to estimate the number of opium users from it, a report of his study is interesting as an indication of the use in Vermont at that time. There appears to be no reason to believe that this report covers a community influenced by any unusual factors but rather it represents a normal distribution of drug users.

The author states:

"Few people are aware of the enormous consumption of narcotics or stimulating drugs. With the development of pharmaceutical science and the consequent improvement and facility in preparing drugs and alkaloids the market has grown accordingly. More widespread knowledge concerning the effects and special uses of opium, cocaine, quinine, Cannabis Indica, Chloral and Heroin, has further stimulated the demand for these drugs, until today the American people are confronted by a problem which is only equaled in its magnitude by its terrible and appalling aspects.

"When we pause to consider the fearful inroads the excessive and habitual use of these drugs make on the mentality, physical health and general existence of those addicted to them, we can easily appreciate what a serious menace to society a rapid increase of drug habitues must inevitably mean.

"It is hardly necessary to speak of the results of the habitual and excessive use of narcotic drugs. Physicians, more than any other class, realize the fearful ravages made on the human system; and the large number of physical, moral and mental wrecks they are constantly meeting who owe their condition entirely to drug addiction, tells eloquently how extensive and far-reaching the drug evil has become. Every alienist is daily being brought face to face with the growing influence of certain drugs on psychic abnormalities and degenerations, and the insidious onset and progress of such conditions, when so produced, cannot fail to impress us with the Medico-Legal importance of the drug habit."

---

[12] Grinnell, A. P.—A review of drug consumption and alcohol as found in proprietary medicine. Med. Leg. Jour., 1905.

In order to secure information as to the consumption of certain drugs, Grinnell wrote the druggists of the State asking them for estimates of their monthly sales of the following drugs and preparations:

> "Opium (gum or powder)
> Morphine sulp. (powder or pills)
> Dover powder
> Paregoric (tinct. opii. camph.)
> Laudanum (tinct. opii)
> Cocaine
> Chloral
> Indian hemp (Cannabis Indica)
> Quinine (powder or pills)?"

Of 130 druggists addressed 116 were heard from. He also addressed 172 general stores which sold drugs in localities where no drug stores existed and three wholesale druggists, but obtained no satisfactory information from the latter.

He states that ninety per cent. of the physicians of Vermont dispense their own drugs and that sales of these drugs to physicians were not included in the figures supplied by druggists.

He also states that the figures he secured could be multiplied by five and be below the actual consumption inasmuch as they include "nothing in the composition of patent medicines or cough medicines; nothing dispensed by physicians; nothing dispensed by these three large manufactories—simply the regular retail drug store businesses and the sales of the 160 general stores."

From these two sources he estimated 3,300,000 doses of opium were sold every month—enough to supply "one and one-half doses of opium to every man and woman in the State of Vermont above the age of 21 years, every day in the year."

The actual amounts sold by druggists as compiled by Grinnell were as follows:

Opium	Morphin (Powdered)	Morphin (Pills)	Dover's Powder	Paregoric	Laudanum
47 lbs. 12 ozs.	9 lbs. 15 ozs.	3338 grs.	25 lbs.	32 gals. 1 qt.	32 gals. 1 qt.

The above figures cover reports from 69 out of 344 towns, and from

116 drug stores out of 130, but do not include amounts sold in the general stores.

American Pharmaceutical Association—1902 [13]–1903.[14]

A committee of this organization, H. F. Hynson, Chairman, reported on the replies received from pharmacists and physicians in certain localities in response to queries sent by the committee. The conclusion arrived at was to the effect that at least five users of certain drugs, commonly known as "habit-forming" but not opium alone, were known to every pharmacist. From this it was estimated that there were at least 200,000 in the country.

In the following year the same Committee with E. G. Eberle as chairman made a more extensive canvass of the situation through letters to all sections of the United States and Canada. As a result of the information so gathered, which dealt with cocain and other drugs as well as opium preparations, the Committee came to certain conclusions, the most suggestive of which follow:

> "General reports indicate that the sale of narcotics is not restricted to any section of the country, nor confined exclusively to the fallen and lower class. Information comes from several sources that in callings which demand many hours' work at a time or the hours of night, cocaine is resorted to for stimulation."

* * * * *

> "We are confident that the use of narcotics is increasing and that evil effects from it will come to succeeding generations. While the increase is most evident with the lower classes, the statistics of institutes devoted to the cure of habitues show that their patients are principally drawn from those in the higher walks of life."

* * * * *

> "Careful study of data personally collected and from reliable sources forces the conclusion that the habitual use of opium in its various forms is increasing and that this increase is confined to no one class or occupation."

* * * * *

> "While it has not been practicable to obtain exact figures, it can be stated that the drug habit is alarmingly increasing among the men of our army and navy. The number of men using opium in the army has greatly increased since the occupation of the Philippines, many 'opium smokers' acquiring the habit there from Chinese or natives. The smoking of opium by the men of the navy does

---

[13] Hynson, H. P.—Report of Committee on Acquirement of the Drug Habit. Amer. Jour. Pharm. November, 1902.

[14] Eberle, E. G.—Report of Committee on Acquirement of Drug Habits. Amer. Jour. Pharm. October, 1903.

not seem to be as prevalent as in the army, gum opium 'pills' or morphine being the way in which the drug is mostly used by sailors. Quite a number of enlisted men have been discharged from both army and navy during the last year because of their being detected as habitual users of opium or morphine—probably several hundred per cent. more during the last five years than for any ten years previous. To the best of the writer's knowledge—and he has carefully inquired into facts —practically all the cases of drug habitues in both army and navy arise from the men learning the habit from natives of foreign countries or from lewd women and men in this country. Not a single case of drug habit coming from the prescribing of an opiate by a medical officer can be recalled, opium and allied drugs being very guardedly and carefully used by army and navy medical officers. A goodly percentage of the cases are men who have acquired some drug habit prior to enlistment while a few—sad to say—are from men of the hospital corps who drifted into the habit from constant opportunity and handling of the baneful drug.

"At the present, it is calculated that there are over a million opium smokers in the United States, the importation of opium for smoking purposes being double that for medicinal uses, amounting to more than 500,000 pounds last year, valued at $3,500,000!"

C. E. Terry—1913.[15]

In 1913 Terry, Health Officer of Jacksonville, Florida, collected data relating to the extent of the problem in his city. The figures were not dependent upon voluntary cooperation as in the case of previous collections of such material, but were secured through the operation of a local law which required, besides the usual prohibition of sale of opium preparations by druggists without physicians' prescriptions and the keeping of records of all sales, two procedures which resulted in bringing to the health office specific information relating to the extent to which opium preparations were employed. The first of these required physicians writing prescriptions containing more than three grains of morphin or its equivalent in alkaloids or salts of alkaloids of opium to send to the office of the health department copies of such prescriptions together with the names and addresses of the individuals for whom they were intended. Second, it provided that the city health officer or other physician in the employ of the city designated by him might give to any user, upon the furnishing of satisfactory evidence of habitual use, a prescription for as much of such drug as might be deemed expedient.

Records were kept of all duplicate prescriptions sent in and of all those issued at the health office. These prescriptions were free and were designed to remove from druggists the temptation of making counter sales on the plea that indigent users or those of small means could not afford to pay for the writing of a prescription in addition to the cost of the drug. The law was enforced actively and both druggists and physicians were watched carefully for violations.

---

[15] Terry, C. E.—Annual Report Board of Health, Jacksonville, Fla., 1913.

No effort was made at this time to limit the use of these drugs in the case of habitual users nor were they subjected to such treatment as might be calculated to discourage them from coming to the health department for a prescription. On the contrary, during the operation of this law—a period of over two years—they were supplied upon application. Treatment was offered them from time to time and furnished to such as accepted the offer.

Through the operation of this law there were recorded at the health office during the year 1913, 541 persons using opium or some preparation thereof or about .81 per cent. of the population of Jacksonville. These were divided into 228 men and 313 women. Of the men 188 were white and 40 colored; of the women 219 white and 94 colored. The population of Jacksonville for 1913 as estimated by the U. S. Bureau of the Census was 67,209. Of this number 32,998 were whites and 34,211 colored. Applied to continental United States on the basis of the estimated population for 1913 of 97,163,330, the Jacksonville incidence gives as the total for the country 782,118.

In interpreting these figures, however, it should be borne in mind that while the percentage of whites using opium in Jacksonville is much greater than that of blacks, the black population in Jacksonville is very high compared to that of the country as a whole. If, as is indicated by the Jacksonville figures, the white race is more prone to use opium than the negro, suitable correction will be necessary in generalizing from the Jacksonville figures. As will be seen later, this same predilection of the whites appears in Brown's figures of the Tennessee studies. These two studies, however, are not sufficient in our judgment to assume the establishment of such racial tendencies as many other factors quite possibly may have influenced these findings.

If, however, such racial tendencies as the Jacksonville and Tennessee findings seem to indicate do exist, then in computing the distribution of opium use in the country as a whole it will be necessary to correct for the different race distribution existing in Jacksonville as compared with continental United States by applying the figures obtained in Jacksonville to the white and black populations separately.

In 1913, the white population of continental United States was 86,580,278 and colored 10,583,052. Applying the Jacksonville figures to the country as a whole, therefore, we get 1,109,340 total opium using population. This naturally is a larger figure than the original crude figure of 782,118.

One source of possible error in figures of this kind exists in the increase which may take place over the normal population of users through the registration of transients. In the case of Jacksonville, however, it would not seem that this was a large factor inasmuch as the registration required either through application to the health office or through the sending of duplicate prescriptions by physicians was not required in nearby states and cities at that time so that it was more difficult for strangers to obtain the drug in Jacksonville than in other nearby points. Whatever this error was, however, it is very much more than offset by the omissions in registration which occurred in the following ways. It was known to the health officer, for instance, that certain business and professional men and other individuals in high social standing who used the drug were never registered but secured their supplies either by mail order from distant points or through friendly physicians or druggists who were willing to risk violating the law for them. Others through the nature of their employment in drug stores or drug manufacturing concerns were able easily to supply themselves, while still others went to nearby points outside of the city limits and hence beyond the operation of the ordinance to secure their supply.

What part differences in race composition (other than negro), economic, occupational and other sociologic factors may have played in vitiating the Jacksonville figures for purposes of generalization no one is in position to say at the present time, as enough studies of the prevalence of this condition in other sections of the country have not been made to justify claims either for or against the existence of such influencing factors. In view, however, of the facilities at hand for the collection of the Jacksonville data, it is believed that they represent very complete information. As in a consideration of Marshall's figures for Michigan, it may be assumed that the distribution of painful maladies and the methods of medical practice in Jacksonville did not differ widely from those of other sections. In 1913, however, the influence of prostitution and what is generally termed the underworld obtained much more prominently in Jacksonville than in the localities of Michigan with which Marshall's figures deal as these were, it will be remembered, all small towns and villages. In the case of the Jacksonville figures, therefore, we may assume that the influence of vicious association was a more marked factor than in the Michigan figures.

The illicit traffic in these drugs was practically negligible in Jacksonville in 1913. One or two peddlers, it is true, supplied certain women in the restricted district more as a matter of convenience to these customers than because of any large profits involved. The traffic could not have been lucrative as free prescriptions were available to any user asking for them and the price of the drug in the drug stores was in the neighborhood of 60 cents for a drachm of morphin when sold in original bottles or large fractions. With this price it is evident that peddlers could not compete with profit.

Lucius P. Brown—1915.[16]

Brown, the State Food and Drugs Commissioner of Tennessee, reported on the results of the enforcement of the Tennessee Anti-Narcotic Law passed in 1913. The law provided for the refilling of prescriptions for persons using opium products habitually "in order to minimize suffering among this unfortunate class, and to keep the traffic in the drug from getting into underground and hidden channels." The law provided that upon application to the Secretary of the State Board of Health and the Pure Food and Drugs Inspector and upon presentation of a certificate from the attending physician, the name and address of the druggist and certain other data, an individual might be granted permission to have a prescription for an opium product refilled. This system brought a considerable mass of data to the officials concerned. It should be noted in explanation that an effort was made at every renewal of permit to lessen the amount of the drug allowed.

After twelve months of operation there were on January 1, 1915, 2370 individuals registered under this system in the state of Tennessee. Of these 784 were men and 1586 women.

In commenting on the accuracy of the registration Brown states:

> "As to what proportion of the total addicts of Tennessee are registered under this permissive system, guesses only can be given. It seems safe to say that not

---

[16] Brown, L. P.—Enforcement of the Tennessee Anti-Narcotic Law. Amer. J. of Public Health, 1915, Vol. 5, No. 4.

over one-half of the addict population is registered—possibly not over one-fourth. Taking, however, the lower figure, it would appear that there are in the neighborhood of 5,000 addicts in Tennessee. The state has about 2.3 per cent. of the whole population of the United States. It is an agricultural state, and consequently, living conditions appear to be not so exhausting as in more thickly settled communities, nor life as a rule, so intense. In order to get the whole number in the United States, we may multiply our figure of 5,000 by 43. This gives us about 215,000 addicts. Probably, however, in order to allow for conditions in cities and industrial communities, we ought to add 25 per cent. to this number, giving not less than 269,000 addicts in the whole United States. In my opinion this is a very conservative calculation. It shows by no means so many as sensational writers appear to want us to believe, and while it thus shows better conditions it is bad enough."

Brown points out that according to figures which he believes to be fairly accurate not over ten per cent. of the cases were colored. He says:

> "This is due in part to the fact that the average negro avoids as far as possible any contact with an official, and to the fact that the negro appears to use relatively less morphine, and more cocaine than the white man."

This agrees with the race distribution in Jacksonville. If we should take Brown's estimate of 5000 cases and distribute them according to what he believes to be a race incidence actually existing, namely 90% white and 10% negroes, we should reach a different total for the country from that reached by Brown. Making this correction and applying, on the basis of Brown's estimate for Tennessee, the race incidence obtaining to the country as a whole, we get 221,818 white users and 11,518 black users or 233,336 as a total in the United States for 1913. If we now add, as Brown suggests, 25% "in order to allow for conditions in cities and industrial communities," we obtain a total of 291,670 for the United States. Whether or not this correction should be made has already been considered in our discussion of the Jacksonville figures. We give it for what it is worth with no claim that the race distribution of opium use in these two localities typifies racial characteristics.

Such a generalization from the Tennessee figures indicates a very much smaller total for the country than is obtained on the basis of the Jacksonville figures, although these two investigations were made within a year of each other. The territory covered by the Tennessee law was very much larger than in the case of Jacksonville and the machinery for enforcement doubtless was less adequate. In Jacksonville, it must be remembered, every physician and every druggist personally was known to the health officer as were most of the opium users and it is to be expected that on these accounts more complete information could be secured than where, for the most part as in the case of Tennessee, it was necessary to rely on correspondence without the close personal touch possible in the smaller territory. Brown himself questions the completeness of his figures, stating that in his opinion they comprise a very conservative estimate.

Which of these estimates is nearer the truth for the period in question no one may state with certainty. It is noteworthy, however, that Brown's figures applied to the country as a whole give a figure but little in excess of that obtained on the basis of the Michigan figures of 1877, about thirty-five years before Brown's work. It scarcely is to be expected that with the influences at work, which we shall note in the next chapter, during this period of thirty-five years, there could have failed to be a greater increase than is indicated by these two sets of figures.

The estimates resulting from studies heretofore quoted represent conditions of opium usage freer from artificial influences of one kind or another than any that have been or will be compiled dealing with later periods. Prior to this time there was no federal law relating to the distribution of the drug and but very few state laws which were at all rigidly enforced, so that peddling of the drugs was not a marked factor in extending their use. The usual causes mentioned, such as the employment of opium and its products in medicine and self-prescribing for the relief of pain and discomfort, the effect of education through ill-considered articles in the lay press and magazines, fiction, vicious or ignorant associations, and the influence of natural tendencies to dissipation or to seek refuge under stress and strain, were operating alone without the additional stimulation of the illicit traffic which was a later development. Wherever, therefore, the exact truth lies as to the number of chronic opium users in the United States prior to the passage of the Harrison Narcotic Act,[17] it represents what might be termed the normal for the United States in contradistinction to an artificial or fortuitous figure resulting in addition to the forementioned causes from the perniciously active propaganda of the commercial trader in opium preparations.

---

[17] The federal anti-narcotic law passed December 17, 1914.

Special Committee of Investigation appointed by the Secretary of the Treasury—1918.[18]

This Committee was unable to determine the exact number of addicts in the United States, owing, as stated in the Report, "to the lack of laws and regulations making it compulsory for the registration of addicts throughout the country or the keeping of any records as to their identity." The Committee believed, however, that a fairly accurate estimate of their number can be made from the information which it has obtained.

One source of information was a questionnaire addressed to all physicians registered under the Harrison Narcotic Act, requesting data as to the number of chronic users under treatment by them at the time. The Committee reports as follows:

> "Replies were received from approximately 30 2/3 per cent of the physicians registered in the different States, and these showed that there were under treatment at that time a total of 73,150 addicts. On the basis of 100 per cent replies, if the same average was maintained, there were under treatment at the time this questionnaire was sent out a total of 237,655 addicts. The following table[19] shows in detail by States the number of addicts reported under treatment, the percentage of replies received from physicians, and the estimated number on the basis of 100 per cent replies."

Another questionnaire was addressed to state, district, county and municipal health officers, the results of which are given as follows:

> "Questionnaire No. 4 was addressed to 3,023 State, district, county and municipal health officers. To this questionnaire 983 replies were received, or 33 per cent of the total number sent out. Only 777 of these, or 26 per cent of the total, contained any information of value to the committee."

The Report summarizes as follows:

> "The number of addicts reported by the health officials replying to questionnaire No. 4 was 105,887. As this number represents the addicts reported by only 26 per cent of the health officials from which this information was requested, it may be assumed that had all the health officials replied the total number would have amounted to approximately 420,000. This number, however, appears to be much too low, in view of the fact that the physicians of the country are estimated to have had about 237,000 addicts under treatment during this same period, and only a small portion of the total number of addicts present themselves for

---

[18] Traffic in Narcotic Drugs—Report of Special Committee of Investigation appointed March 25, 1918, by the Secretary of the Treasury, June, 1919. Washington. 1919.

[19] See table next page.

TABLE II*

Number of Addicts reported by physicians

States	Addicts reported	Per cent. of physicians replying	Estimated number of addicts for 100 per cent replies	States	Addicts reported	Per cent. of physicians replying	Estimated number of addicts for 100 per cent replies
Alabama	739	6 1/3	11,690	Nebraska	339	63 1/4	536
Alaska	10	30	33	Nevada	50	27 1/3	183
Arizona	353	(1)	353	New Hampshire	1,363	39 2/5	3,460
Arkansas	1,250	65 5/6	1,895	New Jersey	2,274	38 2/5	5,900
California	912	27 1/3	3,338	New Mexico	413	(1)	413
Colorado	584	60	974	New York	12,365	33 1/3	37,095
Connecticut	974	56	1,740	North Carolina	2,211	27 3/8	8,077
Delaware	166	42	395	North Dakota	153	16 3/4	913
District of Columbia	443	42	1,055	Ohio	4,151	61 1/2	6,749
Florida	882	25 3/4	3,425	Oklahoma	2,422	53	4,500
Georgia	2,242	58 1/6	3,865	Oregon	369	46 7/9	790
Hawaii	99	(1)	99	Pennsylvania	3,791	36 4/5	10,202
Idaho	7	4/5	875	Rhode Island	548	56	980
Illinois	2,274	27 2/3	8,218	South Carolina	73	(1)	73
Indiana	1,540	18 1/4	8,438	South Dakota	175	16 3/4	1,045
Iowa	1,158	46 2/5	2,496	Tennessee	5,366	65 3/5	8,180
Kansas	1,477	77 1/9	1,918	Texas	498	21	2,371
Kentucky	1,612	42 3/5	3,972	Utah	35	4/5	4,375
Louisiana	1,110	6 1/3	17,620	Vermont	612	39 2/5	1,554
Maine	427	39 2/5	1,084	Virginia	2,566	65 1/4	3,931
Maryland	1,062	42	2,530	Washington	1,373	58 1/2	2,347
Massachusetts	2,272	16 1/2	13,770	West Virginia	1,642	71 5/6	2,286
Michigan	2,752	47 4/5	5,757	Wisconsin	422	(1)	422
Minnesota	1,249	69 1/3	1,802	Wyoming	60	60	100
Mississippi	307	6 1/3	4,873				
Missouri	3,882	14 2/5	26,958	Total	73,150	30 2/3	237,655
Montana	16	4/5	2,000				

---

(1) Per cent replying can not be given, as collectors summarized the data and did not furnish the number of reports.

* From—Traffic in Narcotic Drugs. Report of Special Committee of Investigation appointed March 25, 1918, by the Secretary of the Treasury. June, 1919. Washington, 1919.

treatment. Addicts of the "underworld," for instance, secure most of their supply through illicit channels and rarely, if ever, consult a physician.

"It appears that a more accurate estimate of the total number of addicts may be obtained from the data secured by those investigators who have made an intensive study of drug addiction in certain restricted communities. For example, the health officer of Jacksonville, Fla., reported 887 [20] addicts in that city in 1913. This number represents 1.31 per cent of the population. Upon this basis the total number of addicts in the United States, in 1918, taking the estimated population as 106,000,000 would be 1,388,600.

"In reply to questionnaire No. 4 sent to health officers of States, counties, and municipalities, the health officer of New York City reported a total of 103,000 addicts, which is equivalent to 1.8 per cent of the population. On this basis, there would be 1,908,000 addicts in the United States.

"Information in the hands of the committee indicates that drug addiction is less prevalent in rural communities than in cities or in congested centers. It would, therefore, be unfair to estimate the number of addicts in the entire country on the basis of the figures obtained for New York City. Furthermore, it is the opinion of the committee that an estimate based on the number of addicts in a small city like Jacksonville, Fla., would not be representative for the entire country. Taking these facts into consideration, the committee is of the opinion that the total number of addicts in this country probably exceeds 1,000,000 at the present time."

In reviewing the estimates arrived at on the basis of the replies received to these questionnaires, there arises a question as to what is meant by "treatment." From a later statement in the Report "treatment" here means presumably the supplying of the drug by physicians, but we believe that in replying to this question the average physician would report only such cases as were under *curative* treatment. Be this as it may, the propriety of estimating the number of cases on the basis of 100% replies from physicians registered under the Harrison Narcotic Act is open to question. It is stated in the Report that thirty and two-thirds per cent. of the registered physicians queried replied and that 73,150 cases were reported by them as being under treatment. To assume that the resulting figure of 237,655 calculated on such a basis is a correct estimate, is still not warranted. For such an estimate to be accepted as a logical conclusion on the basis of 100% replies it would have to be assumed that all groups of physicians registered under the Harrison Narcotic Law answered in like proportion. But it is natural to assume that nose and throat specialists, oculists, obstetricians, gynecologists, surgeons and others not occupied with general practice would not be interested to the same degree in replying to the questionnaire. In all probability the thirty and two-thirds per cent. physicians reporting include a relatively greater proportion of those treating addiction cases than those not reporting. Under these conditions the estimated 237,655 addicts is too high a figure. As a matter of fact, however, the Committee appears not to accept this figure, anyway, inasmuch as it ultimately reaches a speculative figure of 1,000,000, inclusive of cocain users.

---

[20] This figure includes 346 cocain users.

As to the estimates based on replies received from state, county and municipal health officers of which the Committee states only twenty-six per cent. replied, we would call attention to the fact that 103,000 were reported by the health commissioner of New York City, with a balance of the twenty-six per cent. reporting only 2887. This material was gathered in 1918. At that time also nothing in the nature of a survey of chronic opium users in New York City had been made. The narcotic clinic was not opened until 1919 and this clinic disclosed but 7464 cases of opium users. It is manifest therefore that the 103,000 reported by the health commissioner in the previous year was wholly speculative. It is also of interest to note that the health commissioner of New York City a year or two later stated that 20,000 was an outside estimate for cases of chronic opium users in New York City.

Here again, however, the Committee admits dissatisfaction with the resulting estimate of 420,000, stating that the figure is too low and ultimately arrives at an approximate figure of 1,000,000 including users of cocain. It is not apparent in the Report how this figure is reached.

New York City Health Department Narcotic Clinic—April, 1919, to January, 1920.

Hubbard [21] reports on the findings resulting from the data gathered during the operation of this clinic over a period of approximately nine months. This clinic was conducted in co-operation with the New York State Department of Narcotic Drug Control. In regard to the extent of opium usage in New York City, Hubbard states:

"The problem of narcotic addiction has been in the public eye for some time, and the differing points of view regarding narcotic addiction have been provocative of some very interesting discussion.

---

[21] Hubbard, S. D.—The New York City Narcotic Clinic and differing points of view on narcotic addiction. Monthly Bulletin, Dept. of Health, City of New York, February 1920.

"In the Spring of last year, the Federal authorities having made several raids on trafficking physicians and druggists, an acute emergency was created whereby it was feared by some that a panic of these miserable unfortunates would ensue. These conditions caused the New York City Department of Health to open a narcotic relief clinic in order to study and examine into the subject of narcotic drug addiction.

Number of Drug Addicts in New York City

"Many opinions regarding the prevalence and frequency of drug addiction have been expressed. No doubt many of these statements are far from true. We do not know who the addicts are, nor how many there are of them, either here or elsewhere in this country. Why? From opinions expressed, and from the literature on this subject, we have been led to believe that addiction was allocated with certain definite physical stigmata; pallor, emaciation, nervousness, apprehension, sniffing, needle puncture markings, and tattoo skin evidences; but in actual experience with hundreds of acknowledged drug addicts, persons actually seeking their drug supply, we find, like the weather indications, all such signs failing.

"There are drug addicts constitutionally inferior, and superior; feeble-minded, and strong-minded; physically below, and above par; morally inferior, and superior. No one class of society seems, in our experience, to enjoy a monopoly in this practice. Our opinions, therefore regarding the number of drug addicts, here and elsewhere about this country, have very naturally had to be revised. While it was the current opinion to think that they existed in vast numbers estimated by some as one per cent. of the community, and even two and three per cent. by others—we, today, think that this is greatly over-estimated.

"It was formerly held that drug addiction was so general and so frequent that if the law—the Harrison Act—was enforced, as it should be, a panic would be created by the immense numbers of addicts who would seek relief.

"The efforts of the New York City Department of Health, actuated and urged by the Commissioner of Health, Dr. Royal S. Copeland, showed that this fear of the production of a panic was a false one. Our efforts were given wide publicity, and the co-operation of medical and scientific societies earnestly and zealously sought to help solve this problem. It might be added also that the raids initiated by the Federal authorities—arresting illicit prescribers and dispensers—together with the New York State Narcotic Commission requiring registration of all addicts in this locality, have not occasioned any undue excitement among these individuals. We, naturally, must infer that the enormous number of drug addicts supposed to exist, in this vicinity at least (and it was supposed to be greater here than anywhere else) are mythical and untrue and that therefore the fear of a panic of these miserable unfortunates was negative."

In his conclusion, Hubbard states:

"The estimate of 1% of our population addicted to the use of narcotic indulgence as a habit—addiction—is very likely greatly exaggerated."

In his general statistics Hubbard gives as the number of users registered during the operation of the clinic (about nine months), 7464 of which 5882 were men and 1582 were women. Applying the incidence indicated for New York City by the number registered at the clinic, we obtain for the country as a whole 140,554 for the year 1919.

A number of factors combined to make the registration at the New York City clinic incomplete. In the first place attendance was voluntary. Further in New York City it was required that not more than a twenty-four hour supply be furnished the addict, so that it was necessary for individuals to visit their physicians or the clinic daily in order to secure the drug legitimately. This requirement tended to influence those for whom it was impossible or too inconvenient to leave their business or work to seek their supply from the illicit traffic or from legitimate sources outside of the jurisdiction of this ruling. The number registered, therefore, represents only those who, because of difficulties in securing their supply by reason of the cost of prescriptions or because the drug was sold more cheaply at the clinic than at the retail drug store in spite of the twenty-four hour ruling chose to attend the clinic.

Also there were several other factors operating, to keep certain classes of users away from the clinic. First there was the inconvenience of the crowded condition of the clinic where applicants were required to stand outside in lines a block or more long in any weather waiting their turn to be examined and otherwise attended to. Second, there was the fixing of an arbitrary dosage and then the enforced reduction by an arbitrary amount. Third, it was required that a considerable amount of personal information having nothing to do with their addiction, such as the name of their employers and their addresses, be supplied and that the photograph of the patient be attached to the registration card.

Drug peddling in New York City was very rife at the time of the operation of the clinic, and every opportunity was offered those who could afford to pay the prices charged by the illicit traffickers in drugs to secure their supplies without submitting to the requirements of the twenty-four hour supply provisions or registration at the clinic.

Narcotic Drug Control Commission—New York—1920.[22]

---

[22] Second Report of the Narcotic Control Commission. 1920.

Referring to the number of users in New York State, Commissioner Herrick says:

> "I think a safe and conservative approximation would be 39,000. The records of the Department show in round numbers 13,000 registered addicts. This number is composed of those who obtain habit-forming drugs through legitimate sources, that is, directly from a doctor or on prescriptions issued by a doctor, filled by a druggist, or from the different clinics established throughout the State. To these figures should be added twice the number, which is an approximation of the users who obtain drugs from peddlers, or other illicit sources. Of course, this latter figure, as I have stated, is only an approximation. I base it on the percentage of addicts among the great number with whom I have personally conferred, who have admitted that they obtained their drugs from peddlers or other illicit sources. Between four-fifths and two-thirds of the registered addicts are located in the city of Greater New York, and the remaining fraction is scattered throughout the rest of the State. The larger the center of population the greater the percentage of addicts."

When applied to the country as a whole, Herrick's estimate of 39,000 addicts in New York State yields a figure of 396,978.

If Commissioner Herrick's statement that between four-fifths and two-thirds of the registered users were located in the city of Greater New York is correct, we have from 10,400 to 8,666 in the Greater City by using his figure of "in round numbers 13,000" for the state as a whole or several thousand more than were registered at the clinic.

It should be pointed out that however far Hubbard's figure falls short of the actual number of users in New York by reason of the forementioned factors, it is at least 500 too low if our interpretation of the Commissioner's report is correct. According to his statement, the Department of Narcotic Drug Control issued exemptions for certain individuals who were not required to register. The number of these exemptions was 500 in the beginning, but later was reduced to 300. In attempting to generalize, therefore, from the New York City clinic figures we must bear in mind the apparently marked incompleteness of these figures. The figure of 7,464 however, as a minimum, is a figure of importance and of itself presents a serious problem, however far it may come from indicating the actual conditions.

Los Angeles Clinic—1920.

In Los Angeles a narcotic clinic was operated from March 8 to August 17, 1920—a period of a little over five months—at which time, according to the report of the medical head, W. H. Bucher, the clinic was closed by federal orders. During this brief period there were registered at the clinic 582 persons—389 men and 193 women. In addition, knowledge was had of 37 individuals who were not registered and given the drug because they were not working, had previous undesirable records or gave insufficient evidence of being chronic users. The exact number, therefore, of users was unknown to the clinic authorities. In the case of Los Angeles as in New York all opium users were not required to come to the clinic and register nor were records kept of cases handled by outside physicians. Another factor which tended to influence the situation in Los Angeles and which did not obtain in like degree in other localities where clinics were operated was the proximity of this city to Mexico. The constant smuggling of the drug furnished easy sources of supply to those who wished to avoid registration at the clinic.

Taking, however, the Los Angeles figures as indicated by the clinic registration for what they are worth, we find at least a minimum of 564 known chronic opium users, giving an incidence rate of about .1%. On the basis of the Los Angeles figure there would be in the United States a total of 102,005 for 1920. It will also be remembered that the Los Angeles clinic was in operation for but five months, while in Jacksonville and Tennessee registration of narcotic users covered a much longer period.

Shreveport, Louisiana, Clinic—1919-1923.

In many respects the next figures to be considered possess a unique value. They were supplied by W. P. Butler, medical director of the narcotic clinic at Shreveport, Louisiana, and include the cases of chronic opium intoxication in the city of Shreveport and Caddo Parish in which Shreveport is located, comprising thus a territory including both urban and rural population. Further they represent only resident cases. Transients, non-residents or those who were induced possibly to seek Shreveport because of the opportunity for attending a clinic and profiting by treatment have all been eliminated by Dr. Butler through his intimate personal knowledge of the circumstances surrounding each case. The size of Shreveport, its relative isolation from populous centres, the absence of large industries and manufactories would all tend to minimize underworld influences as etiologic factors of importance. For the most part these cases represent those arising from the prescribing of these drugs by physicians, from self-medication and that element which everywhere, even without unusual opportunity or artificial incitement, tends to seek adventure, stimulation or solace through the use of narcotics. In other words, Butler's figures represent more nearly than any others in our possession what might be termed a normal incidence[23] as existing in a community where unusual exciting causes have not existed.

Further it should be remembered in considering these figures that the operation of this clinic continued without interruption for a period of nearly four years, from May 3, 1919, to February 10, 1923. This is a longer period of existence than has been comprised in the life of any other narcotic clinic. The methods employed by Butler, differing in several particulars from those employed elsewhere in similar work and the support from local officials, physicians and public combined to make this unusual period of existence possible in view of the attitude of the Bureau of Internal Revenue in regard to the operation of narcotic clinics.

The local educational influence of the clinic undoubtedly was very great in Shreveport and the adjoining rural districts, which fact must not be lost sight of in attempting to generalize from the Shreveport figures. Not only the very great majority of all cases were handled personally by Dr. Butler and his staff—only a very few remained in the hands of private physicians—but the nature of the work was so thoroughly understood and so widely endorsed by the local medical profession that it could not have failed to have a deterrent effect upon the ill-advised, careless or unnecessary prescribing and administering of opium preparations in the ordinary practice of medicine. Therefore, there must have been an influence during the operation of the clinic tending to lessen rather than to increase the number of new cases usually arising from and attributable to the unwise use of opium by the practicing physician at large. In other words, there appear to have been no artificial stimulating influences toward narcotism but, on the contrary, there were present influences which tended distinctly to lessen the formation of new cases.

---

[23] In using the phrase "normal incidence" as indicating the cases of chronic opium usage caused through medical practice, self-medication and constitutional make-up but exclusive of cases stimulated by such artificial influences as underworld association, illicit traffic, etc., we would not be understood as meaning that the normal as at present existing is an irreducible figure. We believe only that it is an actual figure existing as of this time—the present period in medical practice and lay knowledge—that with better medical education and a more widespread dissemination among the laity of the facts of chronic opium intoxication this "normal" in the future materially will be lessened.

Also it should be noted that during the operation of the clinic the illicit traffic was reduced to the minimum if not wholly eradicated. This matter received the particular attention of the Bureau of Internal Revenue whose agents repeatedly visited Shreveport and noted the conditions under which the clinic operated. According to Butler, they stated to him as their personal opinion that the drug was very scarce on the streets of Shreveport; one agent made several attempts at different times to buy the drug or to have it bought, but was unsuccessful.

It would appear, therefore, that one may generalize with less chance of error, at least on the side of exaggeration, from the Shreveport figures than from those of any other locality. Further in such generalizations we have a more nearly accurate portrayal of the extent of the use of opium preparations in this country arising from what we may term the more natural causes,—causes inherent in all communities in which medicine is practiced, painful illness is experienced and predisposing constitutional tendencies do not exist in excess or are not influenced unduly by artificial conditions—than in other generalizations.

In other communities, especially in the metropolitan centres and industrial cities where racial, social and economic factors lead to congested living conditions and tend to stimulate the vicious employment of opium preparations for purposes solely of dissipation, where prostitution is considerably more prevalent and where peddling is highly profitable, we should expect a very material increase in the underworld or vicious element among the drug-using population as a whole. In addition to this, where public and professional attention has not been continuously and for a relatively long period directed at constructive effort toward the elimination of this evil, we should not look for a decrease in the drug-using population resulting from an increased caution on the part of members of the medical profession. Whatever the effect of these two influences in the causation of chronic opium intoxication in such large centres as we have referred to here or elsewhere, the cases attributable to them must be considered as an increment in excess of those normally existing in these communities and resulting from such widespread and omnipresent causes as those apparently responsible and chiefly operative in Shreveport.

The Shreveport incidence, therefore, of opium users for the population at large may well be considered a minimum.

Had Butler not eliminated the non-resident and transient cases, the cases recorded at the Shreveport clinic since its inception would be 1,237. This figure, Dr. Butler states, includes transients, residents, non-residents, and all those dispensed to one time or more and comprises all cases handled by the clinic from the date of its opening to February, 1923. In the case of Shreveport, however, where the collection of information has been made with unusual care and over a considerable period, it has been possible for those in charge of the work to eliminate artificial or unusual conditions and to determine with exactness the true resident incidence. Butler reports this figure to be 371, which covers exclusively those residents registered and cared for during a period of nearly four years. This figure, however, cannot be used for the determination of the addiction incidence in Shreveport, and for purposes of comparison with other surveys for three reasons: First, it covers a period of more than one year, while in the Tennessee, Jacksonville, Los Angeles and other figures heretofore considered the numbers dealt with surveys made during one calendar year; second, the figure is a strictly resident figure, whereas the figures of the other cities deal with the crude population; third, in Shreveport the narcotic clinic and the hospital facilities for treatment undoubtedly attracted addicts from other sections of the country, as the figure of 1,237 given above indicates. Therefore, Doctor Butler has supplied us with the number of addicts treated and registered during one calendar year of the clinic, 1920. The total number of cases treated in this year was 542, but into this figure enters the error incident to the fact that numbers of individuals came to Shreveport throughout the period of the clinic because of the clinic and its facilities. In an attempt to correct for this source of error, it was possible for Doctor Butler to subdivide these 542 cases into residents and non-residents, the basis for the former being residence in Caddo Parish for a period of one year prior to registration at the clinic. The resident figure for 1920 is 211, the non-resident figure is 331. None of these figures unfortunately permits of comparison with the figures dealing with addiction incidence in other communities, inasmuch as these latter figures have included the general run of population usually present in a community, residents and transients, but they did not include—and there was no reason why they should include—individuals especially attracted because of a local situation having to do with the special handling of opium addicts. The true number which would be typical of Shreveport lies somewhere between the strict resident figure of 211 and the exaggerated figure of 542. The resident figure gives to Shreveport an opium user rate of .25%. Applied to continental United States it would furnish a total of 264,276 for 1920. From what already has been said of the conditions under which the Shreveport figures were obtained—the elimination of non-residents, transients, drug traffickers—and from the absence of unusual exciting causes which would lead to the formation of any considerable percentage of vicious or underworld cases, it is at once apparent that this figure represents a minimum and must be considerably below the real number. For we may not minimize without danger of serious underestimation what is so often reported by local and federal authorities throughout the country as a powerful influence in the causation of this condition in the younger age groups of both sexes, particularly of males, namely, the etiologic factor comprised in underworld associations and the commercial instinct of the illicit trafficker.

In the preceding pages we have utilized such figures as we have found available in an effort to show the extent of this problem. These figures have been in some cases incomplete, and in others, for one reason or another, subject to doubt or controversy. Unfortunately a sufficient number of local surveys at any given period has not been made to furnish material for a reliable cross-section of the country. Conditions existing in one section may be attacked with at least a show of justice when applied to others. Population composition, occupation, and even climate, to say nothing of many other sociologic influences, tend to vitiate generalizations made from local data of this kind.

For comparison we are giving in the following table the findings of the surveys suitable for purposes of generalization together with certain computations based thereon. The other surveys of which we have record are too incomplete or for one reason or another too inconclusive to warrant their use as bases for general estimates.

A more recent estimate[24] of the number of addicts in the United States is that of Lawrence Kolb and A. G. Du Mez of the United States Public Health Service. While not based on an original sur-

---

[24] Kolb, Lawrence, and A. G. Du Mez—"The Prevalence and Trend of Drug Addiction in the United States and Factors Influencing It." Public Health Reports—May 23, 1924.

TABLE III
Summary of Surveys and Estimates

Locality	Year	Author	Source	Number of addicts recorded or estimated	Estimated number of addicts in Continental U. S. for given year	Percentage of population affected
Michigan (96 cities)	1877	Marshall	Letters to physicians, one in each locality	1,313	251,936*	.58%
Iowa (Territory covered by 50 reporting druggists)	1884	Hull	Letters to druggists	235	182,215†	.32%
Jacksonville, Fla.	1913	Terry	Clinic and duplicate prescriptions of physicians	541	782,118‡	.80%
Tennessee	1915	Brown	Registration by state law	5,000	269,000‡	.27%
New York City	1919	Hubbard	Clinic	7,464	140,554	.13%
New York (State)	1920	Herrick	Registration by state law	3,900	396,978	.37%
Los Angeles, Cal.	1920	Bucher	Clinic	564	102,005	.10%
Shreveport, La.	1920	Butler	Clinic	211	264,276	.25%

* Based on Marshall's estimate of 7,763 addicts in state of Michigan.

† Based on Hull's estimate of 5,732 addicts in state of Iowa.

‡ Not corrected for race composition.

vey of a community or section of the country, the estimate of these authors is of interest as a result of their analysis of certain recent surveys and other data. In their introduction they state:

> "It is realized that it is impossible at the present time to make an exact count of the persons addicted to narcotics in the United States in an individual State, or even in one of our larger cities, because of the social and legal factors tending to make addiction a secret practice. It is believed, however, that it is possible, by utilizing all of the information now available, to delimit the number by certain maximum and minimum figures. With this object in view, a number of the more important narcotic surveys made in recent years were analyzed; also the reports made by agents of the Bureau of Internal Revenue and other persons on the narcotic clinics conducted in different parts of the country; statistics on the dose of addiction, world production of narcotics, and the quantities imported into this country were compiled and studied; and numerous physicians in different parts of the country were interviewed in person to ascertain the number of addicts they were treating in the course of their practice. The results of these analyses and studies follow:"

After their analysis of the surveys and clinic reports, they conclude as follows:

> "In summing up it may be stated that according to Brown's survey, 215,000 was approximately the number of addicts in the United States in 1915. The

New York City, the Treasury Department, and the clinic surveys were made four or five years later. An objection to making a general application of the New York City survey is that the sex and age distribution of addicts shown by it does not obtain throughout the country. This was probably due in part to the fact already referred to, namely, that young addicts are attracted to large cities, and conditions exist in them which cause a delinquent type of addiction; and it is also due in part to the fact that some of the older addicts were being taken care of by physicians and were not counted when the survey was made. Just how far these two factors balance each other is not known, but the 140,600 indicated by the New York City survey in 1920 shows a reduction over the 1915 figures. The clinic surveys made at the same time or a year later took in nearly all sections of the country and comprised a more representative group of population. These surveys show 104,300 addicts.[25] The Pennsylvania figures, collected over a period of five years and ending about a year after the clinics were closed, show approximately 109,250 addicts in the United States in 1922 when the actual count of 9,000 is used. The Army rate is undoubtedly too low for the particular group surveyed, and for reasons already given for estimating addiction in the population as a whole. The 1918 Treasury Department survey shows 237,655 addicts and apparently contains an indeterminate error of exaggeration, as already pointed out. The highest estimate based on any unrevised survey is 269,000; the lowest, exclusive of the Army survey, is 104,300. These figures may therefore be accepted as the maximum and minimum numbers for the period 1915 to 1922; but from what has been brought out relative to the surveys it would seem that somewhat less than 215,000 is more nearly correct for the beginning and about 110,000 the approximate number for the end of the period."

The second part of their report is a consideration of the estimated number of addicts "based on dosage and available supplies." Using as a basis for their computations an average daily dose of six grains of morphin sulphate, which they state they obtained as a result of their studies, the authors show in tabular form in ten-year periods in the next table the number of addicts who would be supplied if all of the opium entered for consumption were used for addicts.

They state:

"These figures are given for a period prior to the time when restrictions were placed on the traffic in opium, and there was no incentive to the smuggling trade as there is to-day. It is therefore believed that at no time have there been more than 246,000 opium addicts in the United States."

Following the same reasoning in regard to the total world production of opium these authors conclude that at this rate "the total annual

---

[25] A press release from the Narcotic Division of the Prohibition Unit, Bureau of Internal Revenue, dated May 4, 1924, states: "It is estimated that there are upwards of 500,000 drug addicts in the United States. . . ."

TABLE IV

Opium and opium alkaloids entered into United States for consumption.

Decade	Population of the United States	Opium (over 9 per cent. morphine) entered for consumption annually	Opium (smoking) entered for consumption annually	Opium (total) entered for consumption annually	Opium alkaloids entered for consumption annually	Number of addicts which opium (over 9 per cent. morphine) and opium alkaloids would supply with 6 grains morphine sulphate daily	Number of opium smokers which could be supplied at 2½ pounds per year
		Pounds	*Pounds*	*Pounds*	*Ounces*		
1860–1869	34,000,000	110,305	21,176	131,481	588	44,143	8,470
1870–1879	44,000,000	192,602	48,049	241,307	2,296	77,410	19,219
1880–1889	56,000,000	328,392	85,988	414,381	20,212	135,221	34,395
1890–1899	68,000,000	513,070	92,462	605,533	20,193	209,023	36,985
1900–1909	83,000,000	480,009	148,168	628,177	17,511	195,278	59,267
1910–1919	98,000,000	366,054	None	366,054	27,143	151,671	None
1920–1923	106,000,000	144,805	None	144,805	5,282	57,856	None

production of opium, exclusive of that produced in the countries of the Far East, if used entirely for the satisfaction of addiction, would supply only about 566,000 addicts."

It is necessary to emphasize, as the authors themselves have pointed out, how impossible it is to obtain accurate statistics on the world opium production. The data upon which the above estimate of 566,000 was based were obtained from statistics compiled by the Advisory Committee on Traffic in Opium of the League of Nations who the authors state, "admits that the figures given are only estimates in the majority of cases." Further it should be remembered that the annual production figures vary from year to year and an estimate based on the figures for one year—the above estimate of 566,000 is based on the production figures of 1922—is true for that year alone, granting that the figures are correct, and may be quite different from those based on figures of other years.

They continue:

> "It has been shown that at no time have the annual importations of narcotic drugs into this country been greater than would be necessary to supply 264,000

addicts, assuming that they were used in their entirety for the satisfaction of addiction. No one contends that they were so used, but it has been asserted that at least 75 per cent of the quantities imported are used for this purpose. It is believed that a fairly accurate estimate of the amounts used for the satisfaction of addiction subsequent to 1909, when the entry of smoking opium was prohibited, can be obtained by using the import statistics given in Tables 2 and 3.

"For the four-year period, 1920-1923, the importations of opium amounted to 144,805 pounds annually. For this same period 5,282 ounces of opium alkaloids were imported annually. The narcotic division of the Bureau of Internal Revenue estimates that not over 15 per cent of these quantities get into illegitimate channels. Making these deductions it may be assumed that 123,084 pounds of opium and 4,490 ounces of opium alkaloids are required annually to supply the legitimate medicinal needs of the country, including the needs of many old and incurable addicts now being supplied by physicians, which number is constantly decreasing. By subtracting these amounts from the amounts imported annually for the decade 1910 to 1919 we obtain 242,971 pounds of opium and 22,653 ounces of opium alkaloids.

"These quantities would supply approximately 100,000 addicts for a year. Making similar computations for coca leaves and coca leaf alkaloids, it is found that approximately 9,000 addicts could be supplied with the quantities which were formerly imported in excess of what has been imported in recent years. This would make a total of 109,000 addicts who, prior to 1915, could have obtained their supplies of narcotics from the quantities imported legally. In view of the limited supplies of medicinal opium available in the world and the rigid control of narcotics exercised by this country, it is highly improbable that the combined quantities available to addicts in 1919 and 1920 from smuggled sources and from leakage through legitimate channels were more than sufficient to supply the number (109,000). This is probably too high, in view of the reduction which has been shown, but if we add to this figure the number of aged and incurable addicts who received their supplies through legitimate channels, the total number of addicts in this country for the period stated was probably somewhere between 120,000 and 140,000, which is in keeping with the figures arrived at from the surveys and clinic reports.

"That the quantities of narcotics smuggled into this country are in all likelihood not as great as is believed by some, is shown by the quantities reported as falling into the possession of the Bureau of Internal Revenue in the enforcement of the narcotic laws. For the year ending June 30, 1922, the total quantity, including opium and coca leaves, preparations containing opium and coca leaves, the alkaloids of opium and cocaine, and preparations containing these alkaloids, was only 4,447 pounds. In 1923 it was 542 pounds."

In connection with the above statements, we should like to point out that in our opinion a decrease in the amount of drug confiscated does not necessarily indicate a decrease in smuggling. The report of the Special Committee of the Treasury Department, 1918, states that "in recent years, especially since the enactment of the Harrison law, the traffic by 'underground' channels has increased enormously, and at the present time it is believed to be equally as extensive as that carried on in a legitimate manner!" How much of this traffic found its source of supply in smuggling and to what extent the activities of the federal bureau charged with the enforcement of the law have diminished smuggling operations since 1918, we are unable to say. However, we believe that the significance of the above statement should be considered.

Earlier in this chapter we have pointed out the undesirability of attempting to make an estimate of the number of addicts based on the amount of the drug available for consumption and the average daily dose. We again wish to point out the present lack of data, at least in our experience, which would warrant the acceptance of any figure as a representative average daily dose for addicts.

From their interviews with physicians the authors conclude as follows:

> "Confirmation of the estimates based on the supplies of narcotics available and on the findings of the various surveys as to the number of addicts and the trend of narcotic addiction in the United States is furnished by the experience of physicians as related to us. We have interviewed physicians from all parts of the United States and it is unusual to find one who has an addict among his patients. Few besides those who have contact with penal institutions and sanitariums meet any great number. Many physicians still occasionally see a transient addict who drops in and begs for a dose, but this, too, is growing rare. Some of the physicians who have been practicing for years in small towns and rural communities speak of addicts they have cured by the aid of the Harrison law or who have, without outside assistance, cured themselves. Some of them are taking care of one or more old or incurable cases but from the information they give it seems that new cases of addiction are not arising to take the place of the old ones who die.
>
> "The accuracy of our observation is supported by the findings of Dr. Carleton Simon, special deputy police commissioner in charge of the narcotic division of the police department of New York City, who sent out a questionnaire to the physicians in New York State. Of the 7,599 physicians who replied, only 52 per cent reported that they were treating addicts in 1922."

Two questions arise as to the justification of the above deductions based on interviews with physicians throughout the country; first, were a sufficient and representative number of physicians interviewed to portray a fair picture of existing conditions; and second, is it reasonable to expect that the majority of addicts under present conditions place themselves in the hands of physicians? In regard to the latter question we believe that for reasons pointed out in the following chapter the tendency of the physician is to avoid contact with the problem of addiction.

As a final conclusion in regard to the present number of addicts, the authors state:

> "The evidence seems to show that a maximum estimate for the number of addicts in the United States at the present time would be 150,000. The estimates based on actual counts and on the available supplies of narcotics, together with conditions reported by the physicians interviewed, point to about 110,000, which number is believed to be nearly correct."

In general, a review of the material already covered in this chapter will show that in the above study in the first place certain surveys have not been taken into consideration and in the second place, incorrect deductions have been drawn from two of the official reports cited. Among the first may be named the Jacksonville, Fla., survey made in 1913, about a year before the Tennessee study. A consideration of the earlier surveys may have been omitted because of the supposed existence of different influencing factors by reason of time. In regard to this point we believe that however different conditions may be at the present time, the changes have not been great enough to eliminate completely the significance of these early figures.

In regard to the second point, namely the incorrect deductions, it is true that there actually were reported only 73,150 addicts in the survey made by the special committee of the Treasury Department, 1918, which on the basis of 100 per cent replies would yield 237,655 addicts under treatment in the entire country. The report from which they take this figure has already been considered above. The figure which they quote is not given in the original report as the committee's estimate of the total number of addicts in the country, but only as the estimated number of addicts under treatment by physicians during the period when the survey was made, as the report states, ". . . . . . only a small portion of the total number of addicts presented themselves for treatment. Addicts of the 'underworld', for instance, secure most of their supply through illicit channels and rarely, if ever, consult a physician." Further, had Kolb and Du Mez employed the figures resulting from queries sent to health officials they would have reached a total for the country of 420,000 addicts, which figure, the committee's report states, "appears to be much too low in view of the fact that the physicians of the country are estimated to have had about 237,000 addicts under treatment during the same period." Further on the report of the Treasury Department, after considering the errors potentially residing in all of the figures presented, both from general and local sources, reaches the following conclusion: "Taking these facts into consideration, the committee is of the opinion that the total number of addicts in this country probably exceeds 1,000,000 at the present time,"—a statement which Kolb and Du Mez did not take into account. Again, these authors quoted only the lower figures and lost sight of the final estimate of the number of addicts in the state of New York made by Commissioner Herrick in his report of the work of the Narcotic Control Commission when he states:

> "I think a safe and conservative approximation would be 39,000. The records of the Department show in round numbers 13,000 registered addicts. This number is composed of those who obtain habit-forming drugs through legitimate sources, that is, directly from a doctor or on prescriptions issued by a doctor, filled by a druggist, or from the different clinics established throughout the State. To these figures should be added twice the number, which is an approximation of the users who obtain drugs from peddlers, or other illicit sources. Of course, this latter figure, as I have stated, is only an approximation. I base it on the percentage of addicts among the great number with whom I have personally conferred, who have admitted that they obtained their drugs from peddlers or other illicit sources."

The importance of these estimates in relation to their use as a basis for further estimates or comparisons is obvious.

Finally in view of the various considerations pointed out in regard to the above study, we cannot agree that the ultimate estimate of 110,000 is warranted. While we on the one hand deplore unjustifiable, sensational exaggerations, on the other, we recognize the danger of basing maximal estimates on selected data.

One other method of arriving at a satisfying conclusion as to the extent of this problem exists. It is quite remote from what we may term the mathematical procedure, and, while neither specific in its application nor concerned with actual numbers, includes presumptive evidence of such importance and brings into consideration such deep-rooted human attributes and such well-known characteristics as to render it, perhaps, the most important method of all, while, parodoxical as it may seem, the least definite. We refer to a review of the growth in the use of opium through the many and varied motives as presented and revealed by available historic record. That there has been a continuous, marked increase in the consumption of opium and its products in the United States, at least through 1915, is shown in the following table of importations. The supply has but filled the demand. The conclusion is inevitable that the number of chronic users, for one reason or another, steadily has been increasing, as upon the basis of the therapeutic use of these drugs alone—in the treatment of disease other than that of chronic opium intoxication—such an increase would have been impossible. In 1915 two things occurred simultaneously,—the importations decreased and the illicit traffic began to develop. This doubtless was due chiefly to the fact that chronic users, because of the restrictions placed upon physicians and pharmacists in the handling of these drugs, sought their supplies from underworld sources. It does not mean necessarily that the consumption of opium has decreased.

Inasmuch as this comprises a study of the development of the problem of chronic opium intoxication we shall take it up in a separate chapter, tracing its progress through the early unrestricted use and popularity of opium to relieve pain in that period of medical enlightenment when attention was directed at symptoms rather than cause, the ignorance of the dangers of continued use, the discovery of its value for therapeutic uses, the influence of such writings as De Quincey's and others of his day, the introduction and widespread use of the hypodermic syringe, the influence of the Civil War and other wars, the practice of opium smoking, the influence of the patent medicine industry, the discovery and use of heroin, the illicit traffic which has grown up since the enactment of anti-narcotic laws and the general lack of interest and laxness in medical teachings and practice in the employment of opium preparations.

Résumé

The period covered in the foregoing material dates from the earliest time in which this problem in the United States appears to have received individual or public recognition up to the present time. From beginning to end the material is fragmentary. Altogether very few surveys have been made and those that do exist are more or less imperfect due to one or another vitiating factor. Incompleteness seems to be an outstanding feature of practically all surveys. This may be

TABLE V

IMPORTATION OF OPIUM AND OPIUM PREPARATIONS TO THE UNITED STATES FOR THE YEARS 1850-1924.*

Year ending June 30th	General imports		Entered for consumption			
	Crude opium	Opium prepared for smoking	Opium entered for consumption	Smoking opium entered for consumption	Morphin and its salts entered for consumption	Other opium alkaloids or salts or esters entered for consumption
	lbs.	*lbs.*	*lbs.*	*lbs.*	*oz.*	*oz.*
1850	130,349					
1851	40,885					
1852	42,123					
1853	131,370					
1854	108,178					
1855	111,229		107,632			
1856	157,814		152,747			
1857	131,154		125,969			
1858	135,915		125,458			
1859	71,839		65,694			
1860	119,525		116,686			
1861	109,536		103,163		12	
1862	194,844		179,270		1,137	
1863	62,618		56,266		175	
1864	93,114	20,585	76,058	20,585	71	
1865	110,470	13,703	92,099	31,918	172	
1866	180,852	10,611	167,150	9,315	2,098	
1867	135,305	50,551	125,957	32,971	668	
1868	183,263	33,184	94,580	35,500	64	
1869	157,182		90,996	17,941	1,485	
1870	254,609		121,185	12,603	3,187	
1871	315,121		156,618	37,824	237	
1872	416,864		189,355	49,375	240	
1873	319,134		152,770	53,059	589	
1874	395,909		170,706	55,344	1,309	
1875	305,136		188,239	62,775	4,252	
1876	388,311	53,189	228,742	53,189	3,258	
1877	349,223	47,429	230,102	47,428	3,403	
1878	430,950	54,804	207,752	54,804	3,002	
1879	405,957	60,647	278,554	60,648	3,490	
1880	533,451		243,211	77,196	19,386	
1881	318,700		385,059	76,446	22,358	
1882	370,249		227,126	106,221	23,239	
1883	457,499		229,011	298,153	16,782	
1884	326,539	4,633	264,746	1,066	27,850	

1885	351,609	37,475	351,609	37,475	20,710	
1886	471,276	46,207	351,193	49,733	17,611	
1887	568,263	66,232	468,153	60,902	14,311	
1888	447,020	65,986	290,878	72,856	19,154	
1889	391,563	96,678	472,937	79,850	20,725	
1890	473,095	34,465	380,621	58,982	19,954	
1891	466,554	74,462	621,749	61,340	29,464	
1892	587,118	79,466	587,122	78,526	38,758	
1893	615,957	63,222	612,511	66,678	23,700	
1894	716,881	50,102	716,883	51,647	29,076	
1895	358,455	139,765	357,981	115,709	16,029	
1896	365,514	98,745	364,268	123,268	896	
1897	1,072,914	157,061	1,073,999	124,099	14,949	
1898	123,845	100,258	72,287	117,298	15,911	
1899	513,499	124,214	343,283	127,081	13,201	
1900	544,938	142,479	537,004	129,335	26,208	
1901	583,208	117,581	491,448	139,818	50,818	
1902	534,189	160,445	548,673	163,002	38,002	
1903	516,570	212,143	486,613	182,629	12,371	
1904	573,055	142,813	535,048	164,611	20,762	
1905	594,680	159,380	456,563	144,997	21,390†	
1906	469,387	138,649	514,424	139,106	4,131	19,909
1907	565,252	163,278	444,121	151,915	524	27,084
1908	285,845	147,021	320,415	147,624	753	2,050
1909	517,388	92,053	465,781	118,508	152	3,782
1910	449,239		439,379		13,082	22,970
1911	629,842		570,369		20,345	480
1912	399,837		462,462		13,825	634
1913	508,433		490,347		24,797	9,672
1914	455,200		473,716		5,805	11,593
1915	484,027		391,938		1,383	8,676
1916	146,658		161,922		2,685	2,360
1917	86,812		121,006		5,584	34,179
1918	157,834		119,840		25,215	20,479
July 1 to Dec. 31, 1918	66,114		85,106		13,820	47,595
Year ending Dec. 31, 1918	159,621		152,967		30,385	59,270
1919	730,272		344,415		15,760	31,909
1920	211,277		225,528		4,000	6,522
1921	101,668		96,817		3,160	4,275
1922	148,234		141,552		1,800	585
1923	112,377		115,326			1,083
1924	64,041		64,041			65,365
1925	96,848		96,848			
1926	144,011		144,011			

---

* This table has been compiled from the following sources:

(*a*) For the years 1850–1854, E. Young, Chief of Bureau of Statistics Treasury Department, reported in "The Opium Habit in Michigan" by O. Marshall, Annual Report, Michigan State Board of Health, 1878.

(*b*) For the years 1855–1918, A. G. DuMez, Secretary, Special Committee of Investigation appointed by the Secretary of the Treasury, March 25, 1918.

(*c*) For the years 1918–1926, Foreign Commerce and Navigation of the United States Department of Commerce, Bureau of Foreign and Domestic Commerce.

† Separated after 1905 into "morphia or morphine, sulphate of" and "all other alkaloids or salts of opium."

explained by the nature of the problem and the prevailing early and present attitudes toward the individuals affected, as a result of which they are not inclined to reveal their condition. Other influences tending to render the surveys already made inapplicable to generalization are community variations such as race composition, method of conducting survey, method of registration, classes represented in survey, attitude and experience of investigators, etc. Moreover, singularly enough, in spite of a growing interest evinced in the problem as a result of the enactment of the Harrison Narcotic Act, the results of several of the earlier investigations appear better adapted to generalization than most of those made public since the enforcement of this law. In consideration of the above factors it must be concluded that we do not know the total number of opiate users in the United States today.

Whatever their inaccuracies, these surveys and estimates indicate sufficiently clearly the existence of a major medico-social problem to make the denial of the existence of a general situation far more dangerous than its affirmation. As a matter of fact, it is not necessary to know the exact number of users or even the minimal extent, to realize that there are a large number in the country and that the problem is serious.

CHAPTER II

DEVELOPMENT OF THE PROBLEM

In order fully to appreciate the causes which have led to the present widespread chronic use of opium and its derivatives, it would be necessary to dwell at length on the early history of its use and to trace through a long period,—at least the whole of the present era—its development, the growing cultivation of the drug in the Near East and later in the East, the transmission of the knowledge of its medicinal value to new countries and the development of the trade and commerce necessary to supply the growing demand along with the sordid motives which all too frequently foisted the product upon new markets for other than medical uses.

In the present study, however, as a practical measure we have had to confine ourselves chiefly to the latter half of the nineteenth century, when what appears to have been an unprecedented growth in the use of opium and opium products took place. Nevertheless, in order to give the reader some idea of the early unrestricted use and popularity of the drug prior to the beginning of the last century as a factor in the causation of its present widespread use, it is necessary to give a brief sketch of the history of opium and its various preparations as well as of the early development of their therapeutic use.

From the earliest records to which we have had access, opium and certain other narcotic drugs—mandragora, hyoscyamus, hemlock, lettuce and others—are among those known to have been used in medicine. A further search doubtless would show that the first knowledge concerning them is lost in remote antiquity. A. R. Neligan, in his book[1] on the opium question, states: "The earliest known mention of the poppy is in the language of the Sumerians, a non-Semitic people who descended from the uplands of Central Asia into Southern

---

[1] Neligan, A. R.—The Opium Question, with special reference to Persia. London, 1927.

Mesopotamia, there to found a kingdom some five or six thousand years before the birth of Christ."

Presumably Neligan has this information from Doctor R. Campbell Thompson,[a] the archeologist whom he mentions as the author of an "Assyrian Herbal." We have consulted Thompson's translation of the Assyrian Medical Tablets.* These tablets date to the seventh century B. C. and he states they are copies of older texts judging from their similarity to medical tablets found at Ashur, which are some centuries earlier. In a list of 115 of the most commonly mentioned vegetable drugs, opium is mentioned 42 times, which gives it the thirty-third place in frequency of mention. Thompson quotes the following: "Early in the morning old women, boys and girls collect the juice by scraping it off the wounds (in the poppies) with a small iron scoope, and deposit the whole in an earthen pot." He comments that nothing seems to have changed in the collecting of opium. In Arat Pa. Pa, which Thompson gives as the Assyrian for juice of the poppy, he points out a possible origin for *papaver.*

Neligan goes on to say that:

> "It does not require a great stretch of imagination to suppose that even in the days of the Sumerians, or the early Babylonians, some of their neighbours, living in the future home of the Persians, had learned of so striking a drug as opium from them. It is more than probable that the ancient Persians obtained it from Assyria or from Babylon, just as they acquired much of their civilization through their conquests of those States. Nevertheless, it is not apparently until the sixth century A. D. that opium was mentioned in a Persian text. However, the early Persians left no literature other than their sacred books."

Through the courtesy of Professor R. P. Dougherty, in charge of the Babylonian Collection at Yale University, we are informed that the Sumerians must have known of opium as they had an ideogram HUL. GIL which signified this drug. In the medical tablets, above referred to, translated by Thompson, HUL. GIL occurs repeatedly and we are informed by Professor Dougherty that the Assyrians borrowed many ideograms from the Sumerians and used them interchangeably with their own words. The following is quoted from a letter received from Professor Dougherty:

---

[a] Thompson, R. Campbell, M. A., F. S. A., Fellow of Merton College, Oxford.

* The Assyrian Herbal is a translation of the Assyrian Medical Tablets taken from the Royal Library of Ashurbanipal and now a part of a collection in the British Museum.

"I should say that the basic meaning of the sign HUL is 'joy,' 'rejoicing.' GIL as a single ideogram represented a number of plants, but its meaning in the ideogram for 'opium' is difficult to determine with exactness. It may be suggested in a very tentative way that the Sumerians in their system of pictographic writing endeavored to depict the power of opium to produce a sense of delight or satisfaction."

Professor Dougherty says that the ideogram HUL. GIL cannot be definitely dated, but that it probably goes back to the fourth millennium B. C.

From the best obtainable information the original home of the opium poppy was Mesopotamia, and it is not surprising, therefore, that both the Egyptians and Persians acquired knowledge of the drug early. According to Garrison,[b] the Ebers Papyri mention opium among approximately seven hundred remedies. The date of these papyri is thought to be about 1550 B. C.

A more classical mention of the drug occurs in the ninth century B. C. in Homer's *Iliad* where he describes the effect of the cup of Helen, "inducing forgetfulness of pain and the sense of evil." Many authors have quoted this passage. One of the best discussions we have seen is that of Michael Doering,[c] who quotes the opinions of Pliny, Justin, Macrobius, Aetius and others as to the exact nature of the draught.

According to Ernest Martin,[d] Hippocrates[e] (460-357 B. C.) recommended drinking the juice of the white poppy mixed with the seed of nettle for leucorrhea, and in another passage he recommends the use of the juice of poppy in "uterine suffocation" and describes the juice as "hypnotic (*upnotikon*) meconion."

In Francis Adams's[f] translation of Paulus Aegineta, he states that

---

[b] Garrison, Fielding H. An Introduction to the History of Medicine. Philadelphia, 1922.

[c] Doringio, Michaele, Breslaviensi, Philosophiae & Medicinae Doctore. Acroama Medico-Philosophicum de Opii Usu. 1620.

[d] Martin, Ernest.—L'Opium, ses Abus, Mangeurs et Fumeurs d'Opium, Morphinomanes. Paris, 1893.

[e] Hippocrates, T. VIII, Liv. II, p. 253, Sec. 116. T. VIII, Liv. II, p. 386, Sec. 201.

[f] The Seven Books of Paulus Aegineta, translated from the Greek by Francis Adams. London 1844. pp. 279.

Theophrastus[g] (370-286 B.C.) mentions the juice of the poppy and the method of gathering it, calling it "μηκώνιον" (meconion).

Virgil[h] (70-19 B.C.) mentions the sleep-bringing poppy in the Georgics and again in the Aenead.[i]

One of the best concise historical reviews of the use of opium is an article by David I. Macht[1] from which we have drawn freely in the following.

About the year 40 A.D., according to Macht, Scribonius Largus described the method of procuring opium from the capsules of the poppy and Dioscorides in the year 77 distinguished between the juice of the capsules and the extract of the whole plant, which he regarded as less active, describing "the preparation of a syrup of poppy or diakodion, which is the original of the syrup of poppies of the German and other Pharmacopeias to this day."

Later Pliny and Celsus among other Latin writers described the medicinal uses of opium. Galen also "spoke enthusiastically of the virtues of opium confections, and the drug was soon so popular in Rome that it fell into the hands of shop-keepers and itinerant quacks." Arabic physicians used it extensively. One of them, Abu-l-ali-ibn-Sina or Avicenna, recommended it especially in diarrhoea and diseases of the eye. This physician is said later to have died from an overdose of the drug.

It was through the spread of Mohammedanism by the Arabs that opium first reached Persia and later India. Macht continues:

> "Serapio (about 1090) used it freely, and Maimonides and Averroes each wrote a treatise concerning the thebaic. . . .
>
> "The earliest mention of opium as a product of India is by the traveller Barbosa, in his descriptions of the Mallaba coast in 1511. A Portuguese historian, Pyres, in a letter to Manuel, King of Portugal, in 1516, speaks of the opium of Egypt and Bengal. It is from Egyptian Thebes that we have the terms 'opium thebaicum' and the alkaloid thebain.
>
> "Opium is supposed to have been brought to China first by the Arabs, who are known to have traded with the southern parts of the Empire as early as the ninth century. Later the Chinese began to import the drug in their junks from

---

[g] Theophrastus. De Historia Plantorum. IX. 82.

[h] Virgil. Georgics, Lib. I, v. 78—"Lethaeo perfusa papavera somno."

[i] Virgil. Aenead, Lib. IV, v. 486—"Spargens humida melle soporiferumque papaver."

[1] Macht, D. I.—The history of opium and some of its preparations and alkaloids, Jour. Amer. Med. Assn. Feb. 6, 1915.

India. At that time it was used by them exclusively as a remedy for dysentery. It was not before the second half of the eighteenth century that the importation of opium began to increase rapidly through the hands of the Portuguese and a little later through the famous East India Company."

Describing the development of the therapeutic use of opium in Europe, Macht says:

> "Since the time of Galen, the use of opium was continued in a disguised form in various concoctions and confections containing so many ingredients that the distinction between the important and useless could not be discovered. And the value of the drug was overlooked, except by a few brighter minds.
>
> "The famous physician of the middle ages, Philippus Aureolus Theophrastus Bombast von Hohenheim, commonly known as Paracelsus (1490-1540), owed much of his success to the bold way in which he administered opium to his patients. He is said to have carried opium in the pommel of his saddle and called it the 'stone of immortality.' His followers were as enthusiastic as himself over the virtue of opium. Platerus of Basle in 1600 strongly recommended it and Sylvius de la Boe, a famous Dutch physician, declared that without opium he could not practice. The celebrated chemist and physician, Van Helmont, about 1640, used it so frequently that he was called Doctor Opiatus, and Sydenham about 1680 writes that 'among the remedies which it has pleased Almighty God to give to man to relieve his sufferings, none is so universal and so efficacious as opium.'"

The four so-called officinal capitals, mithridatium, theriaca, philonium, and diascordium, were all compounds containing many more or less useful drugs and chemicals selected largely for powers accredited to them by superstition and each one probably owed much of its virtues to opium, one ingredient common to them all. Mithridatium is accredited to Mithridates the Great (about 100 B.C.) and became very popular as a panacea in Rome. Theriaca, a modification of mithridatium, was, according to the same author, invented by Andromachus, the physician of Emperor Nero.

> "According to Galen, the virtues of this panacea were the following:
>
> "'It resists poison and venomous bites, cures inveterate headache, vertigo, deafness, epilepsy, apoplexy, dimness of sight, loss of voice, asthma, coughs of all kinds, spitting of blood, tightness of breath, colic, the iliac poison, jaundice, hardness of the spleen, stone, urinary complaints, fevers, dropsies, leprosies, the troubles to which women are subject, melancholy and all pestilences.'"

In the early part of the nineteenth century, 1803-5, Serturner, a chemist at Einbeck, discovered in opium an acid, meconic acid, and an alkaline base which he called morphium. This was the beginning of modern alkaloidal medicine. Robiquet in 1817 isolated narcotin and in 1832 codein and in the same year Pelletier discovered narcein, thebain, papaverin, cryptopin, gnoscopin, xanthalin and other alkaloids followed as did their derivatives such as apocodein, heroin, dionin, peronin, etc.

When we realize that the chief end of medicine up to the beginning of the last century, was to relieve pain, that therapeutic agents were directed at symptoms rather than cause, it is not difficult to understand the wide popularity of a drug which either singly or combined so eminently was suited to the needs of so many medical situations. Each new compound or preparation acquired its devotees and in one form or another it was unquestionably the chief therapeutic agent for over two thousand years. That its use should spread beyond the ranks of the profession likewise is easily understood as the prototype of the patent medicine vendor of our own era doubtless relied upon its virtues as confidently and profitably as have his successors.

In addition to the above historical outline, it is interesting to note from the original writings of representatives of the various periods the influences tending to increase the popularity of opium. A few are given below:

Jones,[2] in 1700, presents a volume on the physiologic effects of opium, proving to his own satisfaction that the evil effects are due entirely to its "noxious principle." On the title page appears the following:

> "Shews (referring to what Jones claims to accomplish in the book) its *noxious Principle* and how to separate it, thereby rendering it a safe, and noble Panacea; whereof
>
> "He shews the *palliative,* and *curative* use."

Although he realizes the dangers to health and life in the "long and lavish use" of opium from which the rosin or "noxious principle" has not been removed, he fails to appreciate the dangers of small but repeated doses and is convinced completely that opium from which the rosin has been removed is a safe and effective panacea.

> "All, or most *Physicians,*" Jones says, "unanimously agree, That Opium has such a *noxious Quality* that causes *Vomitings, Hiccoughs, Distresses, Anxieties, Convulsions,* chiefly at or about the *Region* of the *Stomach;* and that if it were freed from it, it would be the *noblest* of *Medicaments;* Who can otherwise imagine? seeing it is so excellent and universal a *Remedy,* as it is now used in the *World,* without such an excellent *Preparation* thereof, wherein the *noxious Principle* is separated from it."

---

[2] Jones, John—The Mysteries of opium revealed. London. 1700.

> "Of which Paracelsus says, that whoever shall enjoy it, will be a professor of no less Knowledge than *Apollo, Machaon,* or *Podalyrius,* tho' he was the greatest Master of *Arcanas, Panaceas,* etc., yet does he *confess, 'That a Preparation of* Opium *stood him in stead, and perform'd his Business, when all his great Medicaments fail'd him: and that it will dissolve Diseases, as Fire does Snow;* or uses words to the same *Effect."*

No drug has been applied to so wide a variety of uses as has opium nor has any given rise to so much discussion and controversy as to qualities and therapeutic indications, the form in which it is best given, and the manifold advantages of its use; scarcely a disease exists for which it has not been advocated enthusiastically by some writer. What are now recognized as properties of its individual alkaloids were discussed as contradictory actions long before the discovery of morphin. During the eighteenth century there was a prolonged controversy in which almost every writer on medical topics took part as to whether opium was a stimulant or a sedative. This controversy is well typified in a thesis by Hast Handy and in an inaugural dissertation by Valentine Seaman, both delivered in Philadelphia in 1791-2.

Handy[3] in discussing its action on the body concludes that it is a true stimulant. He describes its use by a well-known surgeon who "always took a considerable dose of opium previously to his performing an operation of any importance" and by a writer of the day who used it to sustain him for a literary composition "which required an uninterrupted exertion of his mental faculties for more than 48 hours," adding that the opium "conducted him to the conclusion of his work with the same vigour and clearness of mind with which he had commenced it." As to its uses in diseases he states that it is employed in "those of greatest debility, and with great success," and quotes Drs. Cullen, Lind and Odier as to its value in the cure of intermittent fever. Quoting Dr. Rush, he states that it is valuable in "all those fevers or stages of fever where wine was safe or proper. I observed the happiest effects from it in the fevers of the military hospitals of the United States during the late war." He emphasizes its use in easing pain, in producing sleep, quoting Dr. Mead who says that "those who take it are so transported that they do not always sleep yet there is no happiness in the world that can surpass the charm of this agreeable ecstasy." He outlines its effect on the stomach, the pulse, the kidneys, in promoting sweat, and on the appetite and in review states that the diseases in which it is "proper" are "those of debility" including spasm, dyspepsia, violent hysteria, hypochondriasis, dropsy, tetanus, and fevers of the typhus kind and venereal disease.

---

[3] Handy, Hast—On opium. Thesis. Philadelphia. 1791.

It is significant that throughout his eulogy no mention is made anywhere of the dangers of continued use.

Seaman,[4] on the other hand, while agreeing as to the efficacy of opium in pain and as a soporific, denies that it is a stimulant in the true sense as Handy and others claimed, attributing its apparent stimulating effect to the fact that when this was observed the opium had been given in alcoholic solution. He advises its use as follows:—in allaying pain in venereal diseases, cancer, stone in the bladder, following fractures, and for nervous headaches. He states that it relieves palpitation, cures asthma and is of use in the "chin-cough, after the febrile symptoms have gone off"; also in the stomach for "pyrosis and gastrodynia" and for vomiting, while in the intestines it relieves cholera morbus, colic, dysentery, tenesmus and simple diarrhoea. It favors expulsion of calculi from the ureters and in the biliary duct and the return of incarcerated hernia. As to voluntary muscles it is useful in tetanus, in some epilepsies, and in convulsions, while in typhus fever he uses it for inducing sleep. He uses it also in acute rheumatism, intermittent fevers, smallpox and many other diseases. This author likewise fails to mention dangers of chronic intoxication or to caution against its continued use.

From the two preceding abstracts it is evident that however the schools of thought differed as to the *modus operandi* of opium their views limited but little their use of the drug in almost all therapeutic situations.

Smith,[5] 1832, in an inaugural dissertation on opium for the degree of Doctor of Medicine at the University of the State of New York, says:

> "There is scarcely a disease in which opium may not, during some of its states, be brought to bear, by the judicious physician with advantage."
>
> * * * * *
>
> "Opium should never be exhibited simply to rouse the spirits, to awaken the fancy or to give a temporary exertion to brilliant wit, this practice is most deleterious. Neither should it ever be used, except to obviate some symptoms of

---

[4] Seaman, Valentine—An inaugural dissertation on opium. Philadelphia. 1792.

[5] Smith, W. G.—On opium embracing its history, chemical analysis and use and abuse as a medicine. New York. 1832.

disease, or for such other purposes as judgment sanctions. Opium should never be used as a substitute for the ordinary stimulus either of wine or spirits; for when it is thus used, it seldom fails to lay the foundation for a long train of morbid symptoms, which, sooner or later, terminate in all the wretchedness, which disease is capable of inflicting; yet this drug is in every day's use, and particularly among the better circles of society, and by the softer sex.

"Fearful of names, rather than of consequences, opium is continually resorted to by many of both sexes, but particularly by females, and these of the higher circles, as a substitute for the stimulus ordinarily afforded by gin or brandy. And hence the emaciation, and most of the long train of dyspeptic symptoms, and gastric derangements so commonly met with in persons in this class of society. But there is another class who resort to opium in some one or other of its forms, either from indolence, or carelessness, or both; I mean mothers, nurses, and those to whom are intrusted the charge of infants. The youthful, inconsiderate mother and the idle nurse, too frequently resort to opium to hush the infant's cries, which might have been done, by the ordinary and only best means of nursing.

"The gay and youthful mother, rather than forego the pleasures of a crowded assembly, or the gaudy charms of a dramatic scene, a single evening, not unfrequently commits the unfortunate infant to its cradle under the influence of opium, in the form, either of Darby's Carminative, the Paregoric Elixir, or Godfrey's Cordial, and even laudanum itself."

* * * * *

"But the injudicious use of opium is not confined alone to mothers and nurses, many practitioners of medicine are also culpable. Like calomel and jalap, which, because it is allowed to be useful in almost all cases, it is often forgotten that there are, nevertheless, many cases in which opium, like that prescription, is not admissible.

"In hope, however, that as the science of chemistry advances, it will continue to unfold even more minutely than it has already done, the hidden principle of activity, alike of many other agents of the Materia Medica, as of opium, we trust that error, like the dew, will vanish under the shining influence of improvement in the profession."

Here is seen appreciation of influences other than therapeutic requirements as factors in the spread of opium use. It was inevitable that a product so varied in its attributes, so potent in its effect, and so widely disseminated and easily procurable should be seized upon under one pretext or another. It is natural that the more advanced thinkers among the laity should turn to a drug whose virtues were so extolled, however erroneously, by the best medical minds of the day and that the unstable, neurotic, or otherwise constitutionally abnormal should avail themselves of its refuge. It is also natural that the writers of this period, impressed by the alleged mysterious and potent qualities of the drug, should introduce it in their works, thus stimulating among their readers a morbid curiosity that not infrequently led to hazardous experiments. At that time, in England, where doubtless through the opium traffic the drug was in more common use than elsewhere among European countries, a major period in literary achievement was in process of birth. It was not unnatural that among this group of intellectual adventurers were to be found some who through physical infirmity or for other reasons seemed peculiarly suited to succumb to the prolonged use of a drug whose stimulating and sedative qualities apparently were so satisfactorily blended. It was peculiarly unfortunate, therefore, that among them arose one whose personality make-up and intellectual gifts combined to induce him to apply his talent to the lauding of an agent which eventually accomplished his ruin. As a fortuitous influence originating neither in real therapeutic need nor in deliberate viciousness but rather in an unfortunate combination of temperament, ill-health, and intellectual gifts, none has been so far-reaching possibly as Thomas De Quincey's "Confessions of an English Opium-Eater," 1821. It is probable that even today of most of those who have come in contact with a considerable number of individuals suffering from chronic opium intoxication, there are few who have not known one or more who owed their first introduction to the drug to a perusal of De Quincey's sorry masterpiece. Not only has it influenced individuals of suitable psychologic make-up to fall under the sway of the drug but also it was the forerunner of a host of other morbid and ill-conceived creations on the part of misleading writers who have chosen to apply what mediocre or other gifts they have had to the stimulating of exploitable desires and weaknesses. This, what may be termed the educational influence, has continued to the present time as is evident to anyone familiar with the periodical or daily press.

An historic example of the influence of De Quincey's "Confessions" is cited in the Knickerbocker Magazine, 1842, by William Blair, who states in partial explanation of the causes leading to his chronic use of opium such as impaired health, ill-nourishment from poverty, overwork, and depression, that he turned deliberately to the drug to enable him to accept a position that had been offered him, as at the time he was too weak to work. He says:

> "The strange confessions of De Quincey had long been a favorite with me The first part of it had indeed been given me, both as a model in English com-

position and also as an exercise, to be rendered into Patavinian Latin. The latter part, the 'Miseries of Opium,' I had most unaccountably always neglected to read."

De Quincey's influence was well recognized by a number of the medical writers who first began to warn both the profession and the public against the growing, widespread and injudicious employment of opium and its derivatives. Thus Calkins in 1871 [6] states:

> "*De Quincey* made his first essay upon opium during his student-life at Oxford. Some gastric derangement, sheltered under that broad-shouldered patronymic, dyspepsia, offered a plausible excuse; but back of this a more cogent incitement was at work, the longing felt for some sort of artificial excitement for occasions, and particularly in anticipation of the Saturday-evening opera. His maximum for the day, 8,000 drops, was attained by the eighth year—a nominal and putative rather than a precisely definite measure, as appears in a declaration recently made by his quondam-friend Sinclair, who had accompanied De Quincey time and again to the apothecary's in Edinburgh where stands Scott's monument, to see him toss off a wine-glass of laudanum and with a sang-froid as if the draught had been mere water.
>
> "*The autobiographer* and essayist, author of 'Suspira de Profundis' (ex Profundis is meant), as also of 'Letters to Young men,' and the rest, was wont to herald every fresh volume of his 'farrago libellorum' with the pretentious announcement, 'By Thomas De Quincey, Author of Confessions of an English Opium-Eater.' On every successive title-page along with the conscious confession to an overshadowing infirmity, is thus paraded a palpable yearning after a notoriety that should preoccupy the public curiosity, rather than a precatory appeal, in arrest of judgment, to a lenient public sympathy. 'Is this a guide to them that sit in darkness, an instructor of the foolish?' He that 'gropeth at noonday as in the night' renders but a dubious protection against the moral titubations of inexperienced youth, who, if walking blindly, appear peradventure less blind than their leader, Quosque tandem?" [7]

---

[6] Calkins, A.—Opium and the opium appetite—1871.

[7] Is it not possible that one aspect of De Quincey's case has been lost sight of by those who so frequently have linked his name with opium? The opium user even of De Quincey's time, as far as we can determine from the literature, did not boast of his affliction and De Quincey's eulogy of the drug and his desire to appropriate to himself credit for an intimate knowledge of its alleged virtues, therefore, do not seem to be characteristic of the opium user. Probably no better example of this attitude of De Quincey, which may of course have been the all too common egotism of the artist, could be found than the following quotation from his Confessions:

> "This is the true doctrine of the Church on the subject of opium; of which church I acknowledge myself to be the only member—the alpha and omega."

May not this attitude be rather the psychologic picture of the alcoholic with his very common megalomania? In this connection, it should be remembered

Here and there during this period a few warnings of the dangers of the too free use of opium were sounded, even as early as 1700 when Jones recognized its dangers to health and life, warning against "a long or lavish use" but failing apparently to appreciate the dangers of small but repeated doses, while his work as a whole encouraged its employment. As a very general rule, however, the medical writings of the day overlooked or failed to emphasize the dangers of continued administration, so that the situation was already bad when the subcutaneous administration by means of the hypodermic syringe introduced an added factor of very marked importance and one which has continued to be felt up to the present time. As Kane [8] says:

> "There is no proceeding in medicine that has become so rapidly popular; no method of allaying pain so prompt in its action and permanent in its effect; no plan of medication that has been so carelessly used and thoroughly abused; and no therapeutic discovery that has been so great a blessing and so great a curse to mankind as the hypodermic injection of morphia."

Nearly two hundred years before the hypodermic injection of drugs was practiced, Sir Christopher Wren, according to Macht,[9] in 1656 first injected drugs intravenously. He employed a quill attached to a small bladder and injected dogs with opium and other drugs and a year later repeated the operation on human beings. Macht also states that J. D. Major, an English practitioner, employed this method in 1662 and others followed suit. Later there followed the *epidermatic* method,

---

that the preparation used by De Quincey was laudanum which contained 45 per cent. of alcohol, so that at the time that he was taking a pint—8,000 drops—a day he was consuming the equivalent approximately of a pint of whiskey. In addition to this amount of alcohol, as his biographers show, he was a generous partaker of wines and cordials. It is, therefore, not astonishing that the evidence of alcoholism is at least as plain as that of chronic opium poisoning. His was really a case of mixed intoxication and he presented somewhat the picture of the more modern indulger who adds cocain to his hypodermic of morphia or his sniff of heroin. The same characteristics are to be found in certain other writers and statesmen of genius all of whom used an alcoholic preparation of opium.

[8] Kane, H. H.—The hypodermic injection of morphine. New York. 1880.

[9] Macht, D. I.—The history of intravenous and subcutaneous administration of drugs. J. A. M. A. 1916. Vol. 66. pp. 856–860, in which Macht cites as his authority Bishop Spratt: History of the Royal Society of London. 1667. p. 317.

that of the direct application of the drug to the skin as in ointments and the *endermic* method of application to a surface denuded of epidermis by blistering or burning with caustics.

According to Roubinovitch[10] the next advance was made by Lafargue of Saint-Emilion in 1836 when he discussed before the *Académie de Médecine* the administration of morphin and other substances by *inoculation.*

Alexander Wood of Edinburgh quite generally has received credit as the discoverer of the *hypodermatic* method of injecting drugs under the skin in liquid form. Kane says that Wood

> " . . . commenced the practice in 1843 and wrote upon it in 1855. Dr. Wood's priority in this matter has been disputed by Rynd, of Dublin, and Kurzak, of Vienna."

It seems certain, according to Macht, that Rynd was the first to use this method. At all events Rynd published in 1845,[11] while Wood's first publication, according to Macht, was 1853.[12] Macht says that the instrument devised by Rynd and described by him in 1861[13] operated by gravity through a hollow needle and that Wood employed a syringe made by Ferguson of London.

Kane also states that Drs. Isaac E. Taylor and Washington claimed to have used practically the same method in 1839. He says:

> "They made an incision into the skin and then injected the drug into the subcutaneous cellular tissue with an Anel's syringe, the nozzle of which was thrust into the cut."

He further states:

> "The claim made by Dr. Taylor is unquestionably a sound and just one, it being supported by the testimony of Prof. Lewis A. Sayre and others, who saw these gentlemen carrying out the practice daily."

Commenting further on the development of the hypodermic syringe, Kane states:

---

[10] Roubinovitch, J., in Ballet's Traité de Pathologie Mentale. 1903. p. 445.

[11] Rynd, F.—Neuralgia: Introduction of Fluid to the Nerve. Dublin Med. Press. March 12, 1845.

[12] Macht fails to give the reference to this first publication of Wood's, but gives the following reference to Wood's second publication, evidently the one mentioned by Kane: Wood, Alexander—New Method of Treating Neuralgia by the Direct Application of Opiates to Painful Spots. Edinburgh Med. and Surg. Jour. 1855. Vol. 82. p. 265.

[13] Rynd, F.—Dublin Quart. Jour. Med. Sc. 1861. Vol. 32.

> "Dr. Wood's syringe-needle was not pointed, and had no lateral opening, it being necessary to incise the skin before introducing it. To Mr. Chas. Hunter, of London, is due, however, the highest praise of all . . . Hunter added the needle point, lateral opening, and made many other small but important improvements."

Undoubtedly Hunter did much to extend the use of the hypodermic in England, publishing many papers on its advantages and studying its effect on both man and animals. Others who endorsed it in England were Olliver, Bonnar and B. Bele. Its use was extended rapidly to the continent where it was received favorably by Montpellier, Behier, Courty, Richet, Trousseau, Herard, and Pravaz in France and by Scanzoni, Oppolzer, Graefe, Eulenberg, Erlenmeyer and Lorent in Germany and Austria. Pravaz improved the instrument and his name has been identified since with certain models.

According to Kane, Fordyce Barker of New York was the first to employ "the hypodermic syringe proper" in this country. He received one from Prof. Simpson while visiting in Edinburgh and used it here in May, 1856.

Macht gives to Ruppaner of Boston the credit of introducing the method into the United States, while Kane credits him with doing much to popularize and extend the practice. Ruppaner used chiefly liq. opii seditavus (Squibb), 100 drops of which equalled one grain of morphia while Wood employed Battley's solution, a preparation double the strength of the tincture of opium.

With the advent of hypodermic medication through the use of this instrument two new influences at once were brought to bear upon the development of the problem of chronic opium intoxication. One of these was the obvious advantage of this method of administration of therapeutic agents, such as the vegetable alkaloids, over mouth or other methods, as being more exact and more prompt in action and in requiring smaller doses. The other was the belief that with the administration of morphin through the skin the danger of the development of what generally was known as the "opium appetite" could be eliminated. It must be remembered that up to that time cases of the opium "appetite" or "habit" had developed through oral administration only and it was classed in the same category as other substances such as alcohol for which an appetite or liking or habit developed. This idea further may have been fostered by the use of alcoholic preparations of opium such as tinctures, which very commonly were used, or by the not infrequent taking of laudanum or other opium preparations in wine or liquor. It must be remembered also that at the time of these inventions and for many years thereafter biochemistry as it is understood today was quite unknown as were all of the other modern theories which have been advanced to explain chronic opium intoxication. Likewise the personality factor as interpreted by psychiatrists of today and the development of psychopathologic changes, resulting from the use of the drug with its strong appeal to certain temperaments, were all unrecognized and in the new method were seen only the more obvious advantages already mentioned. As a result the hypodermic use of morphin spread rapidly. As it became more common, hypodermic syringes were left with patients and practically every painful condition was an indication for its use. In America the instrument came into general use later than in Great Britain but its popularity was stimulated markedly during the Civil War. This was the first occasion when the instrument was available for the wholesale relief of pain.

It must not be supposed that during all this time no cases of chronic opium intoxication resulting from the hypodermic use of morphin were noted. As a matter of fact Wood's wife was probably the first individual to succumb to this method of administration, dying a victim of her husband's ingenuity. Other cases must have been noted but for one reason or another warnings of the dangers inherent in this method were very slow to come. The first record of warning as to the danger of hypodermic administration that we have found was made by Nusbaum [14] who, according to Allbutt,[15] drew attention to the danger as early as 1864. In 1869 Parrish [16] refers to the growing popularity of this method of administration and cites a case whose chronic use of morphin dated from his introduction to the hypodermic syringe. In Allbutt's writings we are told that Hunter [17] also published a warning in 1869 and Allbutt himself in 1870 [18] sounds another early warning.

---

[14] We have been unable to find Nusbaum's original statement.

[15] Allbutt, T. C.—A system of medicine. New York, 1905.

[16] Parrish, Joseph—The Probe, January, 1869.

[17] Presumably this is Charles Hunter who in a number of articles extols the hypodermic use of morphin, but we have not found any record of a warning written by him.

[18] Allbutt, C.—On the Abuse of Hypodermic Injections of Morphia. The Practitioner, 1870, Vol. V, p. 327.

From his statement we may conclude not only that the hypodermic was used for the relief of pain but also that it had become well and favorably known among certain groups for purposes of dissipation to such an extent that the fiction writers of the day adopted it or were employing it much as have certain sensational writers of our own time. Thus Allbutt states:[18]

> "Now that the hypodermic use of morphia is brought into sensational novels as a melodramatic device it may indeed be said to have reached the height of fashion. We may thank our stars if one of us be not seen ere long, syringe in hand, between Aspasia and Clodius in the windows of the Burlington Arcade."

The author admits that in his previous writings on the subject he has recorded the virtues of this admirable remedy and extended its application but states that it seems nevertheless "the duty of those who use so potent a medicine, to consider the full bearings of their practice and to make themselves as well aware of its dangers as of its virtues."

He states that little or nothing has been said of harm that may result from it and that among the numerous essays and records concerning the hypodermic use of morphia he cannot call to mind one in which its possible dangers have been considered, but he feels that "the time has come when the attention of the profession will be called to this less pleasant side of the account."

Injected morphia, he says, at first seemed different from swallowed morphia and no one had any experience of ill effects from it, but gradually he became convinced:

> "that injections of morphia, though free from the ordinary evils of opium-eating, might, nevertheless, create the same artificial want and gain credit for assuaging a restlessness and depression of which it was itself the cause. Certainly, all the patients I have named fall off in the same way when the morphia fades from the system, and in all there is an indescribable depression and irritability which alone the morphia can relieve, and for which it is accordingly again and again administered. They are all satisfied that without the morphia the pain must return and will keep them in agony, and, when efforts are made to omit the dose, the pains do return until the fortitude of the patient is broken down, and the morphia is called for. At such times I have certainly felt it a great responsibility to say that pain, which I know is an evil, is less injurious than morphia, which may be an evil. Here is experience needed. Does morphia tend to encourage the very pains it pretends to relieve; or if not, does it at any rate induce in those who use it constantly, an artificial state which makes its further use a necessity? Are the subjects of morphia injections, that is, liable to become depressed, relaxed, irritable, and dependent upon a new habit of constant intoxication? If

this be so, we are incurring a grave risk in bidding people to inject whenever they need it, and in telling them that the morphia can have no ill effects upon them so long as it brings with it tranquillity and well-being."

Calkins,[19] 1871, after describing the technique of opium-smoking mentions the use of the hypodermic needle but concludes that "any reliance placed upon this form of use, however, for its supposed comparative security, is likely to prove delusive."

While warnings such as these were being given, the medical journals of the day were full of enthusiastic descriptions of new successes in therapeutics through the hypodermic use of morphin and it is very doubtful if any painful condition to which the human race is heir escaped the list of those for which the drug was recommended.

In America following the Civil War the increase in opiate use was so marked among ex-soldiers as to give rise to the term "army disease" and today in more than one old soldiers' home are cases of chronic opium intoxication which date from this period. Crothers,[20] 1902, states:

> "Many veterans of the Civil War became morphinists to relieve the pain and suffering following injuries received in the service, and the addiction is often concealed to prevent the possibility of imperiling their application for pension. The theory obtains that morphine-taking is a wilful vice and the disabilities from its use should not be recognized by the Pension Bureau. . . . The sufferings and hardships growing out of the perils of war often react in illness, nerve and brain instability, and feebleness, and the use of morphine is a symptom of damage from this source which should be recognized as its natural entailment and sequel by the Pension Bureau."

Further reference to the influence of the Civil War is made in the extracts quoted from correspondence published in the report of the Massachusetts State Board of Health in 1871.

Following such articles as that of Allbutt, other medical writers cautioned against the too free use of the hypodermic and against the dangers of leaving it with the patient or family. It gradually became recognized by some to be a more dangerous method of opiate administration than any other.

McFarland,[21] 1877, states:

---

[19] Calkins, Alonzo.—Opium and the Opium Appetite. Philadelphia, 1871.

[20] Crothers, T. D.—Morphinism and narcomania from other drugs. Philadelphia, 1902.

[21] McFarland, S. F.—Opium Inebriety and the hypodermic syringe. Trans-New York State Med. Soc., 1877.

"If cases of opium inebriety occur as frequently in the private practice of other physicians as they have in my own, it is coming to be a serious matter, and a few words of caution, against the indiscriminate use of so active a drug, may be pardonable.

"Since the introduction of the hypodermic syringe, especially, there has been a noticeable increase in the frequency, as well as the severity, of the cases; and I wish to enter a protest against its imprudent use, and particularly against leaving it in the hands of patients or their friends, to be used at their discretion, or even allowing them to know that they can use it, except in the greatest emergencies; for once in their possession, and used for any considerable length of time, they will seldom discontinue it, and will soon be inquiring where they can get 'one of those things.' It is certainly a most valuable instrument in the hands of the discreet practitioner, and will reach cases which nothing else will, with a certainty and promptness which is very satisfactory; but it is too potent for evil, as well, to be trusted beyond his grasp."

Kane,[22] 1880, states:

"The danger of contracting this habit from the hypodermic use of morphia was recognized in the very infancy of the practice, but was scoffed at or disregarded until a few years ago, when the profession in Germany, England and America awoke, almost simultaneously, to a knowledge of the fact that the habit had become alarmingly common, and that it had been contracted, in the majority of instances, through the carelessness of the physician, who had taught either the patient or his friends how to use the instrument.

"Some of my correspondents, men of ability, and in large practice, express themselves as very skeptical of the truth of the statement that the morphia habit has ever been formed by the use of the drug hypodermically. Testimony from all parts of the civilized world settles this matter beyond question. Bartholow, from whose excellent little work I have so often quoted, says:

" 'The introduction of the hypodermic syringe has placed in the hands of man a means of intoxication more seductive than any which has heretofore contributed to his craving for narcotic stimulation. So common now are the instances of its habitual use, and so enslaving is the habit when indulged in by this mode, that a lover of his kind must regard the future of society with no little apprehension. It may well be questioned whether the world has been the gainer or loser by the discovery of subcutaneous medication. For, every remote village has its slave, and not unfrequently several, to the hypodermic syringe, and in the larger cities men in business and in the professions, women condemned to a life of constant invalidism, and ladies immersed in the gayeties of social life, are alike bound to a habit which they loathe, but whose bonds they are powerless to break. Lamentable examples are daily encountered, of men and women, regardful only of the morphia intoxication, and indifferent to all the duties and obligations of life, reduced to a state of mental and moral weakness most pitiful to behold.' "

---

[22] Kane, H. H.—loc. cit.

Kane then gives the following precautions to be taken in order "for the patient to recover without any desire to continue the use of the drug":

> "1. The drug in any form or in any manner should never be used in cases where the patients are of decidedly nervous temperament or when they are in a condition of neurasthenia, so long as some other drug can be found to accomplish the same end, even though relief be a little less rapid.
>
> "2. In any case the drug should be used only in quantity just sufficient to obtain relief. It is surprising in how many cases decided relief from pain will result from the subcutaneous injection of morphia in very small doses (1/16 to 1/6 gr.), especially if the puncture be made deep into the muscular structure of the part.
>
> "3. The earliest opportunity for decreasing the amount of the drug should be carefully watched for and the necessary gradual decrease in the strength of the solution be made.
>
> "4, Where morphia is to be used for any length of time, atropia should be combined with each dose of it, in small amount (from 1/90 to 1/120 gr.) as Bartholow is of the opinion that the danger of contracting the habit is thus lessened.
>
> "5. The patient should be kept in utter ignorance of what the solution contains, and of its strength. Under no condition whatever should the patient, his friends or attendants be instructed in the use of the syringe."

After outlining these rules for the prevention of addiction-formation, Kane mentions briefly conditions which have been found to be benefited by the hypodermic use of the drug. These he lists as follows:

Anaemia, Cerebral
Angina Pectoris
Asthma
Blepharospasm
Bronchitis
Cholera
Cholera Morbus
Cholera Infantum
Carcinoma
Cystitis
Continued Fevers
Convulsions, Hysterical
Cardiac Diseases
Chorea
Delirium-Tremens
Dyspnoea
Dislocations
Diabetes
Dyspepsia, Nervous
Diarrhoea
Emphysema
Epilepsy
Gastric Catarrh
Gastric Ulcer
Hepatic Colic
Hepatic Cancer
Hepatic Abscess
Insomnia
Incontinence of Urine
Itching
Laryngismus Stridulus
Lead Colic
Lumbago
Malaria and Malarial Neuroses
Mania and Insanity
Meningitis, Cerebro-Spinal

Muscular Spasm
Neuralgia
Nymphomania
Ovarian Neuralgia
Pleuritis
Pneumonitis
Pericarditis
Peritonitis
Polyuria
Renal Colic
Rheumatism
Shock
Spinal Irritation
Sprains
Tetanus
Uraemia
Vaginismus
Vomiting of Pregnancy

While others here and there issued similar warnings, it must be remembered that the great bulk of the medical profession practiced medicine more or less empirically, that interest in medical societies and medico-social problems was much less active than it is today, and that medical news like lay news travelled less rapidly and was disseminated less widely. Further, while here and there the more thoughtful and observant members of the profession noted the harm that was being done, they did not all write about it and such comments as they had to make doubtless were made within the small circle of their acquaintances rather than to larger groups. Meanwhile the ease with which pain could be relieved through the hypodermic administration of the drug, the time it saved the physician in his busy rounds, the contentment it brought the patient, and above all the all too common inclination to relieve symptoms rather than cause, contributed to increase the practice. Consequently throughout the period of the earlier warnings of its dangers the employment of this mode of administration was increasing by leaps and bounds wherever medicine was practiced. From the earliest warnings until 1900 the great majority of textbooks on the practice of medicine, materia medica, and therapeutics failed to issue any warning of the dangers of the hypodermic use of morphin.

In 1903 Roubinovitch [23] records his belief that

> "the great majority of morphinists and morphinomaniacs owe their intoxication above all to the hypodermic introduction of the alkaloid of opium, which does not in any way exclude the possibility of reaching the same pathologic result as that of morphinophagia, a much rarer procedure.
>
> "We can then say that the subcutaneous method, which constitutes one of the greatest acquisitions of modern therapeutics, has contributed considerably in ignorant and unpracticed hands, to the development of morphinism. It would be puerile to hold this method responsible for it; everything depends on the persons using it."

---

[23] Roubinovitch—loc. cit.

Shortly after the end of the Civil War the smoking of opium, which had hitherto been confined in this country to the Chinese, began among the whites. According to Kane[23a] a sporting character by the name of Clendenyn was the first white man to smoke opium in San Francisco in 1868. The second, Kane says, induced to try it by the first, smoked in 1871. He continues as follows:

> "The practice spread rapidly and quietly among this class of gamblers and prostitutes until the latter part of 1875, at which time the authorities became cognizant of the fact, and finding, upon investigation, that many women and young girls, as also young men of respectable family, were being induced to visit the dens, where they were ruined morally and otherwise, a city ordinance was passed forbidding the practice under penalty of a heavy fine or imprisonment, or both. Many arrests were made, and the punishment was prompt and thorough.
>
> "On this account the vice was indulged in much less openly, but none the less extensively, for although the larger smoking-houses were closed, the small dens in Chinatown were well patronized, and the vice grew surely and steadily."

As will be seen by consulting Table V, page 44, importations of smoking opium "entered for consumption" rose markedly in 1871 and never again touched the relatively low figures of preceding years, 1864 to 1870 inclusive, until 1884 when the extremely low figure of 1066 pounds was recorded, but as will be seen elsewhere this was the result of certain special factors.

The story of opium smoking in the United States is one which repeatedly has been told and which from time to time has been the subject of much public interest and of many official investigations. Further consultation of Table V will show that the peak in pounds imported was reached in 1883 when 298,153 pounds were entered for consumption. A second peak of 182,629 pounds was reached in 1903 and after 1909, in which year 118,508 pounds of smoking opium were entered for consumption, the importation of this form of opium entirely ceased and has never been resumed legally since.

Kane and other writers have described the rapidity with which the practice spread from San Francisco eastward involving practically every town and city in the country in its progress from the West to the East coast. The numbers of individuals who used opium in this form during the height of its popularity and before active law enforcement measures and other factors succeeded in controlling it to a large extent is not known. Various estimates have been made but obviously in a practice of this kind which was always frowned upon by the general public, as well as by official circles, no accurate figures could be obtained. From the amounts imported, presumably large numbers were involved. For the past ten or fifteen years, however, the smoking of opium has ceased to be a problem of any magnitude in the United States, though it is not a wholly extinct practice. It, however, must not be overlooked, in considering the development of the opium problem as we know it, that in many individuals still living the use of opium in other forms is the result of earlier experience with smoking opium. The equipment required, the odor of the burning drug and later its cost all combined to make relatively easy the closing of the places where the drug was used in this form, once public opinion and police activities were awakened.

[23a] Kane, H. H.—Opium-Smoking in America and China. New York, 1882.

The only measures employed for the control of importation of smoking opium before the passage of the Harrison Narcotic Act were those involved in the imposing of more or less heavy import duties, and, as will be seen by consulting Chapter XI, the importation figures varied from time to time as the import tax was raised or lowered. Concurrently, however, with the lessening of imports, due to heavy taxes, as Hamilton Wright states, smuggling operations increased and while the legal importation ceased entirely, as has been stated, in 1909, smuggling of this form of opium continued and to some extent exists today. It is not inconceivable that taxation and police and other activities had less to do with the ultimate near-control of the practice of smoking opium in the United States than had the popularizing in the underworld of the hypodermic and the sniffing of heroin, forms of indulgence that were cheaper, more convenient, more adaptable to many surroundings, and far more easily concealed from friends, public and authorities.

Another influence which operated undoubtedly to extend the use of opium and its derivatives especially during the latter half of the nineteenth century was the patent medicine industry. It would be impossible to form any accurate estimate of the influence exerted by the widespread sale and use of nostrums containing opium, but that this influence was great and contributed in an appreciable degree to the habitual use of the drug is undoubted. It must be remembered that those who employed these secret remedies were for the most part ignorant of drug dangers, sick, frequently in pain, and often suffering from some chronic malady and hence in a mental state which rendered them easy victims to the specious advertisements of the manufacturers. How widespread the custom of self-medication with patent nostrums became in this country is a matter of common knowledge. Newspapers and magazines were filled with fraudulent and misleading but seductive advertisements, while from billboards "pain-killers," "cough mixtures," "soothing syrups," "women's friends," "consumption cures," and a host of others, furnished a constant suggestion that could not fail to have its effect upon a considerable proportion of the population. The peak of the patent medicine industry was reached just prior to the passage of the federal Pure Food and Drugs Act in 1906.

Practically all remedies advertised for painful conditions, such as consumption, coughs and colds, pelvic troubles of women, cancer, rheumatism and neuralgia, as well as soothing syrups for babies, and diarrhoea and cholera mixtures contained opium or some of its products and depended principally on these drugs for such virtues as they possessed. It is not surprising that many persons became dependent on these preparations and later turned to the active drug itself when accidentally or otherwise they learned of its presence in the "medicine" they had been taking. Obvious and logical as was the influence of the patent medicine industry, it cannot be measured with any degree of accuracy and therefore must be accepted along with certain other influences such as the counter sales of the drugs themselves—equally immeasurable as a causative factor—as an extremely vicious and probably a very active influence. Many physicians who have treated numbers of cases of chronic opium intoxication in private practice mention instances of cases that owed their origin to the use of opium-containing nostrums.

One phase of the secret remedy evil which deserves special mention is that dealing with remedies for the so-called "drug habit." As was shown in various articles in the Journal of the American Medical Association,[24] in the President's Homes Commission Report,[25] in Samuel

---

[24] Nostrums and Quackery, Articles on the Nostrum Evil and Quackery. Reprinted with additions and modifications from The Journal of the American Medical Association, American Medical Association, Chicago, 1912.

[25] Report of Committee on Social Betterment by George M. Kober, M.D., Chairman of Committee. President's Homes Commission, Washington, D. C., 1908.

Hopkins Adams, "Great American Fraud" series[26] and elsewhere, these drug cures depended for their action upon the very drugs causing the condition for which the patient sought relief, or if not on the identical drug at least upon another derivative of opium. All that the patient gained was a change from one opium preparation to another at a greatly increased price.

It is not improbable that in this period of its development along with a better appreciation of the dangers of continued opiate administration and the influence of the Pure Food and Drugs Act with its attendant publicity, the extent of chronic opium intoxication would have been lessened appreciably except for the entrance of a new factor. It must be remembered that at this time textbooks on practice of medicine and therapeutics were beginning to include warnings against the indiscriminate use of opium, and that while twenty or even ten years before it was the exception to find any such admonitions, students of medicine around 1900 had a better opportunity to avoid the mistakes of their predecessors. Knowledge was becoming more widespread than before; the evils of opium-smoking had been brought forcibly before the public by periodicals and the press; and laws directed at the control of this form of opium abuse were being contemplated. In fact certain states had already legislated against opium dens.

Unfortunately, just at this period when more accurate and widespread knowledge and better methods of medical education might have tended to retard the growing use of opium, a most unfortunate influence became operative. Dreser in Germany in 1898 produced heroin or diacetylmorphin which was put out as a safe preparation free from addiction-forming properties, possessing many of the virtues and none of the dangers of morphin and codein, and recommended even as an agent of value in the treatment of chronic intoxication to these drugs. Probably no remedy ever was heralded so enthusiastically as was heroin. The prominent place held by opium derivatives in therapeutics, the constant calls on every physician to relieve pain and induce sleep with drugs, and the relative inadequacy of all substitutes for opium combined from the outset to stimulate the use of heroin. It was apparently the ideal preparation,—potent analgesic and sedative,—at the same time possessing other qualities highly desirable in certain ailments, above all freedom from the dreaded so-called "habit-forming" qualities of the parent drug.

---

[26] Adams, Samuel Hopkins. The Great American Fraud. Articles on the Nostrum Evil and Quackery. Reprinted from Collier's by American Medical Association, Chicago, 1913.

This situation and its significance perhaps best may be appreciated after a brief review of some of the published opinions on heroin resulting from experience gained in the employment of the drug in medical practice. These have been taken from medical journals of repute in Europe and America and, while they comprise by no means all of the current medical literature of the day dealing with the advantages and disadvantages of heroin, they furnish undoubtedly an accurate picture of the prevailing opinions. As will be seen from the following, while the specific indications for heroin varied according to the opinions of the different writers, it was advocated sooner or later for practically every condition in which morphin or codein had been found useful with the addition of being declared valuable in the treatment of chronic intoxication to these drugs.

Floret,[27] 1898, after six months' use of the drug in the *Poliklinik der Farbenfabriken,* states that heroin appeared to be unusually useful, prompt, and dependable in coughs and irritations as well as in pains in the chest and in primary irritations especially of the upper and lower air passages both in acute and chronic form. He states that in dry bronchitis where codein was not effective heroin was and also that it was valuable in the treatment of tuberculosis and asthma. Nothing was said as to its dangers. Floret experimented with the drug at the request of Dreser.

Dreser [28] previously had reported favorably on a pharmacologic and therapeutic study of the drug.

Strube,[29] 1898, states that his own pharmacologic investigation made on rabbits, dogs, and cats led to the results published by Dreser as to the strength and action of the drug and that following this study he tested it on 50 patients at the Medical University Clinic of Berlin. Most of the material at the clinic were cases of phthisis. He describes the doses employed to produce sleep and relieve the cough and states that the results were satisfactory. He observed no bad effects of any kind but states:

---

[27] Floret—Klinische Versuche uber die Wirkung und Anwendung des Heroins. Therap. Monatsh, 1898. XII.

[28] Dreser, H.—Pharmacologisches uber einige Morphinderivate. Therap. Monatsh. 1898. XII.

[29] Strube, G.—Mittheilung uber therapeutische Versuche mit Heroin. Berl. Klin. Wchnschr. 1898. XXXV.

> "Patients took the drug willingly and habitués were satisfied with the exchange; many in whose case it was given under proper indication, asked for it again, if it was replaced by something else or by codein. Whether this gives the first sign of habituation to the drug, I cannot decide with certainty, but this is possible since in patients who took it over a long period, I had to increase the dose gradually and what was obtained at first with 0.005 g. later took 0.01-0.015 per dose and 0.02 per day. It naturally will take further observation to decide, whether on continued use injury to the organism is caused, and whether we shall have a heroinism related to chronic morphine intoxication. So far, I have sought in vain for indication of it in the appearance of the pupils, constipation, etc. From its not inconsiderable narcotic action and the inclination of the patients to use it again, I have deemed it advisable to use it only under strict control and not too freely, so that its good action, which it has under the proper indication, will not fall into discredit through abuse and indolence."

It is noteworthy that in Dreser's[30] announcement to the Congress of German Naturalists and Physicians, 1898, he stated that heroin was ten times as efficacious as codein in lessening frequency of respiration, while only one-tenth as toxic as the latter drug.

In the same year, Manges[31] reported on the use of heroin in coughs, beginning phthisis, and asthma and referred to the treatment by Hirt of Breslau of 35 cases of morphinism of which 27 were cured, and 2 committed suicide during the first three days of withdrawal.

In 1900 in a second report on heroin based on data obtained by correspondence, Manges[32] reviews 341 cases in which the drug was used. He recommends it for many uses and says that habituation has been noted in 6% or 8% "without the bad effects accompanying the morphin habit, none of the patients having suffered from it."[33]

On the other hand he states that large numbers of the reports say that the same dose may be used without any habituation. He gives two cases in which it was used in breaking up the "morphin habit" and says it should be tried further for this purpose.

---

[30] Dreser—Abstract in Jour. Amer. Med. Assn., 1898.

[31] Manges, M.—New York Med. J. Nov. 26, 1898.

[32] Manges, M.—New York Med. J. Jan. 20, 1900.

[33] The significance of Manges' statement that heroin leads to habituation but "without the bad effects accompanying the morphine habit" is not quite clear especially when taken in connection with his advocacy of the drug in the treatment of chronic morphin intoxication.

Weiss,[34] 1898-99, advocates the use of heroin without reference to possible dangers.

Harnack,[35] 1899, states:

> "From all that we know so far on heroin in animals and man, I am of the opinion that the delivery of the drug to the profession was precipitate and that a dangerous poison was placed in the hands of unsuspecting physicians, in respect to which not enough can be said in warning."

Turnauer,[36] 1899, was delegated by his chief, Dr. Pal, to test out heroin with especial attention to its eventual harmfulness. The maladies treated were phthisis, acute and chronic bronchitis, and dyspnoea of all kinds. He experimented with 48 cases, stating that he noted a tolerance to the drug insofar as the dosage had to be increased in nearly all cases in which the drug was given for a long period. Yet he says as far as he could observe there were "no harmful results, especially as I observed no abstinence symptoms whatever. Generally it appeared that in all cases in which a period of time was allowed to elapse the full effect could again be obtained with small doses." He observed nausea in only two cases. He further states:

> "In any event, from this as well as from my observation, it may be concluded that, regarding tolerance to heroin, certain individuals react peculiarly and it is recommended that in the case of old and feeble persons, the initial dose should not be above 0.005."

* * * * *

> "In the above cases, heroin was found to be in general a harmless drug, which in most cases, even in patients accustomed to narcotics, can be used with success for treating coughs and forms in this connection a valuable addition to our therapeutic agents."

Holtkamp,[37] 1899, Wierzbicki,[38] 1899, Bougrier,[39] 1899, Lang,[40] 1899, and Herwirsch,[41] 1899, all recommended the use of heroin in many conditions and either fail to warn of its dangers or state that it does not lead to tolerance.

---

[34] Weiss, J.—Heroin, ein neues Substituens des Morphins. Die Heilkunde. 1898-99. Vol. 3. pp. 12-14.

[35] Harnack, E.—Ueber die Giftigkeit des Heroins. Munch. Med. Wchnschr. July 4, 1899.

[36] Turnauer, B.—Ueber Heroins Wirkung. Wien. Med. Presse. 1899. Vol. 40.

[37] Holtkamp, A.—Weitere Mittheilungen uber therapeutische Versuche mit Heroin. Deutsche Med. Wchnschr. Apr. 6, 1899.

[38] Wierzbicki, S.—Klinische Beobachtungen uber den therapeutischen Wert des Heroins. Klinische Thera. Wchnschr. July 2, 1899.

[39] Bougrier, L.—Étude chimique, physiologique et clinique sur l'héroine. Thesis. 1899.

[40] Lang, C. T.—Heroin. Med. Times and Register. 1899. Vol. 37.

[41] Herwirsch, C.—Heroin in Cough. Therap. Gaz. 1899.

Horatio C. Wood, Jr.,[42] 1899, reviews the claims made for peronin, heroin and dionin and welcomes them as substitutes for morphin. He states:

> "Of course, it is hardly possible to say as yet whether these remedies are likely to cause drug habits."

He states that it is worthy of note in this connection that both peronine and heroin must be given in ascending doses in order to maintain their effect.

Einhorn,[43] Witthauer,[44] Runkel,[45] Kropil,[46] Pollak,[47] and Wiesner [48] in 1900 all recommended the use of heroin without referring to any attendant dangers.

Saint Martin,[49] 1900, reported favorably on the drug after conducting experiments on three dogs.

In America in 1900, McGee,[50] Fulton,[51] Floeckinger,[52] Brown and Tompkins,[53] Lowenthal,[54] Daly,[55] Lazarus,[56] Hyams,[57] Gifford,[58] and

---

[42] Wood, H. C., Jr.—The newer substitutes for morphine, peronine, dionine, heroin. Merck's Arch. 1899.

[43] Einhorn, M.—Phila. Med. Jour. Oct. 28, 1899.

[44] Witthauer, K.—Erfahrungen uber heroinum muriaticum. Die Heilkunde. 1899-1900. Vol. 4.

[45] Runkel, J.—Uber die Verwertung des Heroins in der Kinderpraxis. Inaug. Dissertation. 1900.

[46] Kropil—Ueber die Unschadlichkeit des Heroins. Allg. Med. Central Ztg. 1900. Vol. 69.

[47] Pollak, J.—Wien. Klin. Wchnschr. Jan. 11 and 18, 1900.

[48] Wiesner, J.—Heroin in Surgical Practice. Internat. J. Surg. 1900. XIII.

[49] Saint Martin, T.—Étude expérimentale des effets de l'administration répétée et prolongée de l'éther diacétique de la morphine. Echo. Méd. de Lyon. 1900.

[50] McGee, J. B.—Heroin in coughs. Cleveland J. M. 1900. Vol. V.

[51] Fulton, H. D.—New York Med. Jour. Dec. 20, 1899.

[52] Floeckinger, F. C.—New Orleans Med. and Surg. J. May 1900.

[53] Brown, S. H. and E. D. Tompkins.—Ther. Gaz. Aug. 15, 1900.

[54] Lowenthal—Heroin in the treatment of phthisical cough and whooping cough. Phila. Med. J. 1900.

[55] Daly, J. R. L.—Boston Med. and Surg. Jour. Feb. 22, 1900.

[56] Lazarus, B.—A contribution to the therapeutic action of heroin. Boston Med. and Surg. J. 1900.

[57] Hyams, B.—Therapeutic studies of heroin hydrochloride. Med. News. 1900.

[58] Gifford, S. L.—Types of cases illustrating the action of heroin hydrochloride. International M. Mag. 1900.

Geis[59] all report favorably on this drug after using it for coughs, respiratory diseases, pertussis in children, and as an analgesic and hypnotic. For the most part no mention is made of any dangers consequent upon its use, while Gifford and Brown and Tompkins specifically state that it does not produce addiction.

Joseph Jacobi,[60] 1901, after reviewing the experimental and clinical work on heroin, investigates the drug in 85 cases and comes to the conclusion that heroin is superior as a cough soothing drug and should be classed with morphin. He noted that in patients who had never used a strong narcotic drug heroin had a better effect than in those who had used one. This he does not attempt to explain. As to tolerance, he states that if the use of heroin is stopped for several weeks the same doses will be effective as before and that it may be alternated with morphin and codein.

In America, 1901, Martinson,[61] Center,[62] and Keown,[63] all recommend the use of heroin in therapeutics without mentioning its dangers.

Stewart,[64] 1901, recommends it and states that it is not cumulative and does not tend to produce "habit" but adds: "It should not be put into the hands of patients as it is liable to be overused."

G. W. Wood,[65] 1901, after using it in ten cases states it has no tendency to "habit" formation.

Morel-Lavallée,[66] 1902, recommends that in incurable painful maladies it be used in the beginning as it does not cause the euphoria of morphin. Later when from prolonged use its effect is lost, it may be replaced by morphin. He warns against the habit-forming property of heroin in spite of the claims that have been made to the contrary, but thinks it is safer to use than morphin in new cases who have never been accustomed to morphin. Elsewhere it appears that Morel-Lavallée advised the use of heroin in demorphinisation in certain selected cases, as Comar and Buvat,[67] in commenting on the frequency with which in recent years writers have advised, in the treatment of morphinism, the substitution of some of the derivatives of morphin such as heroin and dionin, criticize Morel-Lavallée's use of heroin even in chronic users of small doses of morphin. They state his teachings have not been followed with the reservations he imposed, but rather have been used indiscriminately, with the result that heroinism all too frequently has been substituted for morphinism. These authors have treated three such cases of heroinism and one of dionism. Duhem [68] also confirms this opinion and states that from then on (1900) the number of heroin users constantly has increased in general practice.

---

[59] Geis, N. P.—Heroin as an analgesic. New York Med. Jour. 1900.

[60] Jacobi, J.—Ueber die Wirkung des Heroins. Wien. Med. Wchnschr. 1901.

[61] Martinson, I. J.—Some experiences with heroin. Med. Times. 1901.

[62] Center, C. D.—An inquiry into the action of heroin hydrochloride. Med. Fortnightly. 1901. XIX.

[63] Keown, T. W.—Carolina Med. Jour. 1901.

[64] Stewart, W. B.—Oklahoma Med. Jour. 1901.

[65] Wood, G. W.—Cincinnati Lancet-Clinic. Nov. 16, 1901.

[66] Morel-Lavallée, A.—Les Alcaloides de l'Opium, Morphine, Héroine, Dionine. Révue de thérapeutique. 1902. Vol. 69.

Jarrige,[69] 1902, says, in a review of the work which had been done on heroin, that many articles appearing on heroin have advocated the use of the drug in the treatment of morphinism and he fears that, just as the physician was primarily and principally responsible for the creation of morphinists, he will also become responsible for the formation of heroinists. He calls particular attention to the advertised claims of the virtues of heroin as a substitute for morphin in general therapeusis. He gives the details of the symptoms and treatment of several cases of heroinism, following morphinism or set up in morphinists through treatment by substituting heroin for morphin, stating emphatically that the withdrawal of heroin is accomplished with much more painful and serious symptoms than is that of morphin. He defines heroinism as "the need of heroin," stating that like morphin to the morphinist it is a necessary poison.

The author quotes Morel-Lavallée as follows: "I consider heroin as an admirable medicine from many points of view even if we did not hope through it to some day witness the end of morphinism," and states in contradiction that inquiries made in various institutions where these conditions were treated elicited invariably warnings against the use of heroin in the treatment of morphinism.

In conclusion he states that far from being valuable in the treatment of morphinism heroin only has added another form of narcotism to the already long list.

---

[67] Comar, G. and J. B. Buvat—Les Toxicomanes. Presse Méd. July 6, 1904.

[68] Duhem, P.—L'héroine et les Héroinomanes. Progrés. Méd. Feb. 23, 1907.

[69] Jarrige, J. L.—Héroinomanie. Thèse de Paris. 1902.

Pettey,[70] 1903, is among the first in America definitely to warn the profession of the dangers of chronic heroin intoxication. He reports that out of his last series of 150 cases of drug habit eight used heroin. In three of these the use of heroin dated from the beginning of their addiction. He states that these cases presented the same difficulty in treatment as do morphin cases.

Montagnini,[71] in Italy, 1904, reports a case of heroin habit which he considers of interest inasmuch as heroin had been recommended as the drug that did not possess the dangers of producing "habit" and that could be successfully employed in treating morphinism.

Sollier,[72] 1905, vigorously attacks the practice of using heroin in the treatment of morphinism or with the idea that the drug does not possess a tendency to tolerance-formation. He states that for several years heroin has been substituted for morphin for the cure of morphinism and that there are now met almost as many heroinists as morphinists. He compares the substitution of heroin with that of cocain in the treatment of opiumism, stating that the latter although essentially false in principle was better justified than the use of the former, as it had to do with chemically different and to some extent antagonistic substances. With heroin, however, no more is accomplished than if the extract of opium were substituted for laudanum or morphin for the latter.

The statements to the effect that heroin is no more toxic than codein, he says, are mistaken as all the heroinists whom he has seen were more profoundly poisoned than were morphinists on equivalent doses. One, he states, is struck at once by their cyanosis, their anaemia, and greater weakness. He states that they are not able to stand the use of the drug as long as are morphinists but deteriorate very rapidly both physically and mentally. He deplores Morel-Lavallée's advice to use heroin as a substitute for morphin in the treatment of morphinism even though only small doses have been used. He states that heroin more than morphin affects the respiration and that in the withdrawal of the drug syncope of respiratory origin is dangerous and difficult to deal with, as the readministration of the drug does not relieve the collapse.

---

[70] Pettey, G. E.—The heroin habit another curse. Alabama Med. Jour. 1902-3. XV.

[71] Montagnini, T.—La Riforma Medica. Aug. 30, 1904.

[72] Sollier, P.—Héroine et héroinomanie. Presse Méd. 1905.

Atwood,[73] 1905, recalls the claims that heroin is a safe anodyne and hypnotic lacking the objectionable features of opium and morphin. He reports a case of heroin addiction following the surgical use of the drug in a woman who had been cured of her morphin habit years before and warns that, although cases of heroin habit are as yet comparatively rare, they are apt to increase unless more caution is used in administering the drug to neurotic individuals and in coughs, neuralgias, rheumatism, recurring headaches, etc.

In 1906 the Council on Pharmacy and Chemistry of the American Medical Association [74] tentatively accepted, for inclusion in the proposed annual "New and Non-Official Remedies," heroin and heroin hydrochloride giving their therapeutic indications as follows:

> "When given in small doses heroin hydrochloride has apparently no effect on any of the vital functions except respiration. . . .
>
> "In large doses it may produce dizziness, nausea and occasionally constipation and in poisonous amounts, twitching of the extremities, great exhaustion and dimness of vision. . . . The habit is readily formed and leads to the most deplorable results."

* * * * *

> "On withdrawing the drug from habitués there is said to be a tendency to respiratory failure."

* * * * *

> "Heroin and its hydrochloride are recommended chiefly for the treatment of diseases of the air passages attended with cough, difficult breathing and spasm, much as the different forms of bronchitis, pneumonia, consumption, asthma, whooping cough, laryngitis and certain forms of hay fever. It has also been recommended as an analgesic, in the place of morphine in various painful affections."

Duhem,[75] 1907, comments on the increasing number of heroinists seen during recent years and the difficulties in the way of dangerous symptoms which occur in withdrawing this drug. He states that Pouchet pointed out the dangers of heroin when the medical profession was enthusiastically turning to it as a substitute for morphin, which warning, he states, has been well justified.

It has been stated that the widespread use of heroin as a substitute for morphin and as a more stimulating narcotic drug became a matter of general knowledge first in the underworld and that long before the average physician had become aware of the dangers of the drug it was being used freely by certain groups of individuals, especially young men, frequenters of the underworld districts. This is borne out in the report of the health department of Jacksonville, Fla.,[76] when in 1912 the extent of opiate use was investigated. In that year there were 22 heroin users recorded among 343 users or 6.41% of the whole. In 1913 the percentage of heroin users was 5.18% and in 1914 5.27%. In the report of 1914 the statement is made in connection with etiology that heroin is used principally as the result of dissipation and is commonly combined with cocain. The percentage of heroin users as given is incomplete inasmuch as, in the case of individuals who used cocain and an opiate combined, the name of the opiate is not given.

---

[73] Atwood, C. E.—A case of heroin habit. Med. Rec. June 3, 1905.

[74] Journal Amer. Med. Assn. Oct. 20, 1906.

[75] Duhem, P.—loc. cit.

By this time, about 1910, the profession largely had awakened to the dangers of substituting heroin for other opium derivatives and of employing it where any other derivative would be contraindicated. An increasing number of articles pointing out the dangers of heroin administration began to appear in medical literature. Finally the use of heroin declined but its abandonment has been less rapid than was its adoption. Today there is a strong sentiment among the profession that the manufacture of this product could be abandoned entirely not only with benefit to mankind in general but even without serious handicap to drug therapeusis. Other members of the profession, however, claim that heroin in certain conditions has decided advantages over other derivatives of opium.

At the same time, however, common knowledge of the properties of heroin, as well as its significance as a health and social menace, had spread so rapidly through non-medical channels that the opinion of the medical profession as to its safety or danger as a therapeutic agent became a matter of little or no interest.

With the advent of the early state prohibitory laws and later the passage of the Harrison Narcotic Act, the rôle played by heroin particularly in the underworld became at once apparent. With the enforcement of these laws and the consequent restriction placed on physicians, druggists, and manufacturers of pharmaceutical preparations, an illicit traffic hitherto sporadic became general and apparently well-organized. Heroin particularly was adapted to the purposes of the vendors of illicit drugs, inasmuch as its morphology permitted easily of adulteration with sugar of milk or certain coal-tar products while morphin could be so treated only with difficulty. It was, therefore, the drug of choice in the underworld traffic.

---

[76] Annual Report Board of Health. Jacksonville, Fla. 1912-1913-1914.

The more recent percentage of heroin users in relation to the total number of opiate users does not indicate the actual rôle of heroin as an etiologic factor in chronic opium intoxication, inasmuch as the ease with which the drug can be purchased on the streets from peddlers has induced many users of morphin, laudanum, and other opium preparations to change to heroin in order to conceal their condition from official or professional knowledge. Consequently the use of heroin became later not so much a matter of etiologic importance as of current expediency.

In reviewing the very remarkable history of the rapid increase in the use of this drug, its wide popularity as a therapeutic agent, the acclaim with which it was received by the medical profession, and the persistence with which manufacturers advertised its virtues both in technical and lay publications, it is astonishing that physicians were so slow to recognize its dangers and that for the first six or eight years of its employment there were only a few among the large number who proposed its employment in an ever increasing number of conditions, who appreciated the harm that was being done. One wonders why during this period members of the profession, to whom cases of chronic heroin intoxication must have appealed for treatment and who scarcely could be unaware of the growing popularity of the drug among the laity, did not come forward in greater numbers with appropriate warnings. The fact remains, however, that for twelve or fourteen years after its introduction current medical literature included constant references to its value as a therapeutic agent in almost every variety of complaint.

As an influence in the causation and extent of chronic opium intoxication, the illicit traffic in opium and its preparations occupies a much disputed position. If we were to judge by the press notices dealing with alleged confiscations of illicit drugs by federal, state, and municipal officials concerned with law enforcement, we might conclude from the amounts almost daily mentioned in proof of their activities that the importation of opium as recorded in official quarters formed but a small portion of the supply reaching this country. As the amounts confiscated, however, usually are stated in terms of value rather than in pounds or ounces and as these values frequently may refer to the prices asked by peddlers, it is not unlikely that false impressions are made upon the public as to the quantities seized.

As far as we are aware and for reasons which are quite obvious and inherent in the traffic itself, there are no accurate figures in existence. The report of the Committee on Traffic in Narcotic Drugs, appointed by the Secretary of the Treasury, published in June, 1919, states:

> "In recent years, especially since the enactment of the Harrison law, the traffic by 'underground' channels has increased enormously and at the present time it is believed to be equally as extensive as that carried on in a legitimate manner. This traffic is chiefly in the hands of so-called 'dope peddlers,' who obtain their supplies by smuggling from Canada, Mexico, and along the Atlantic and Pacific coasts."

With the sources of information at its command it would seem that this Committee should have had the very best of opportunities to determine accurately the extent of the traffic. The above quoted statement, however, comprises all that the report makes public in this connection and the methods or sources of information which led the Committee to arrive at this conclusion are not mentioned.

There is scarcely a writer who has not referred to the illicit traffic. There is certainly not a law enforcement officer who does not dwell on it. From the statements of individual users from every section of the country with whom we have talked from time to time, there is apparently no place in the United States where these drugs are not available through underground sources of supply if the purchase price is forthcoming. From time to time investigators of other social problems in the course of their studies have uncovered evidence of a widespread traffic in these drugs and have reported the same to our Committee.

That the illicit traffic operates directly to create new users is indicated in the histories obtained by investigators in different sections of the country. There are two motives apparently behind this influence. The peddler seeks by inducing individuals to try these drugs to increase the number of his customers. He supplies a few doses, enough to create a demand for more, and then charges for later supplies. Another not uncommon factor in the creation of new users is found in the activity of certain users, those of the underworld type, who seek to insure their own future supplies by creating a demand for the drug in acquaintances whose financial status is better than their own. Like the peddler they supply these friends with enough of the drug to acquaint them with its "virtues" and then, when a certain degree of dependence has been established, leave them to shift for themselves in anticipation of sharing their supplies in time of need. One or another of these factors repeatedly is encountered in the histories of a certain type of opiate users, more especially of those who use heroin. How widely they have operated and how many new victims thus have been claimed, no one is in a position to state, but apparently such influences have contributed materially to the number of new users of opiate drugs.

One other possible factor contributing to the present extent of the problem has been advanced and has given rise to considerable discussion. Its importance to the reader depends on the conception held as to the actual nature of chronic opium intoxication and the degree to which the field of medicine is involved in the solution of the problem. This factor is comprised in the attitude of the medical profession, first because of tradition, inadequate training or indifference and later because of the operation of prohibitory laws and regulations. That the attitude of the medical profession exerts some influence on the extent of the problem can not be doubted; but there may be difference of opinion as to its importance. The following explains the way in which this factor operates according to those who emphasize its importance:

For the past seventy-five or one hundred years along with the growth of the patent medicine industry there have developed in this and other countries hundreds of "cures" and "treatments" for chronic opium intoxication, ranging all the way from ten or fifteen dollar "home cures" to be used with or without the patients' knowledge, to alleged respectable hospital treatments endorsed by medical men in more or less good professional standing. For the most part, as has been conclusively demonstrated by the United States Bureau of Chemistry working in co-operation with the Post Office Department, by Mr. Adams in his "Great American Fraud" series, by the American Medical Association in its Journal and through its published analyses, as well as by a number of others, the active principle of practically all the home remedies was either a product or derivative of opium in some form or some other powerful drug in dangerous doses such as cocain, chloral, etc. In the great majority of cases, however, these fraudulent cures relied on an opium product, not infrequently the same one that the patient seeking treatment was already taking, such, for example, as morphin. Others preferred to substitute some other opium preparation for the form of drug used by the correspondent. To the morphin user heroin would be sent and to the heroin user morphin. A favorite method of supplying these so-called treatments was in a series of daily doses of such high opium content as to preclude their being safely taken by an intolerant patient. The advertisements of these preparations made the most unwarranted promises and the whole method of procedure from the magazine or newspaper statement which first caught the patient's eye down to the last dose of the last bottle was deliberately fraudulent and without any excuse in rational practice. That thousands of sufferers were duped by the claims of the home remedy "ghouls," as Mr. Adams calls them, is a matter of common knowledge.

In addition to the home remedies there sprang up all over the country private hospitals or sanatoria which through seductive advertisements drew large clienteles. Many of these also were fradulent in character and made no effort to cure their cases, discharging them when their funds were exhausted still suffering from the intoxication from which they sought relief. Others were run by men who were simply ignorant or possibly indifferent and whose therapeutic measures, while not deliberately fraudulent, were so ineffective and left their patients in such a depleted state both physically and mentally as to make their return to the drug a matter of but a short time. The lack of interest on the part of the medical profession at that time is shown by the fact that the advertisements of many of the latter class of institution were accepted by reputable medical journals; in fact, it is only during comparatively recent years that the Journal of the American Medical Association and others of equal standing have refused to carry advertisements without making preliminary investigations as to the nature of the treatment and the standing of those in charge. Today there are unquestionably a considerable number of institutions where little or no knowledge of chronic opium intoxication is had but to which through advertisements and correspondence sufferers from this condition are drawn for treatment.

While the enormous growth above referred to of the home remedies and institutions was a direct result of advertising and other publicity, it is very doubtful if they could have obtained the hold on the opium-using public which they did if the regular medical profession, except for relatively few individuals, had not shown a lack of interest, the natural outgrowth of the generally accepted theories as to the nature of the condition. It is quite natural that, because of tradition and the resulting lack of medical teaching on the subject, the profession as a whole should have been neither interested nor informed.

The result of the aforementioned conditions was, as may be understood readily, the perpetuation of chronic opium intoxication. Patients wandered from one institution to another, bought this remedy and that, applied in vain to their family doctor for suggestions or help, and finally, impoverished, and discouraged, gave up the fight and as best they could continued a miserable existence the reasons for which they could not understand and for which, in many instances, they were not responsible.

The passage of the Harrison Narcotic Act and the adoption of regulations relating thereto have also contributed to the creation of the present attitude of the medical profession. It must be remembered that prior to this time counter sales of these drugs had been the rule in most states and thus the user secured his accustomed amount. With the enforcement of the new law limiting the distribution to one channel physicians were appealed to by hosts of patients who previously had bought directly from the retail druggist or by mail order from the wholesaler. This adjustment was not too difficult, however, and while it somewhat increased the cost to the drug user and added inconvenience it doubtless had a beneficial effect as it brought these cases into the hands of the physician and led to an increase in professional interest that stimulated study and inevitably would have led to many cures and improvements in methods of treatment. The enforcement of the regulations, however, in some cases called into question the judgment and integrity of physicians and druggists and indictments were brought against members of both professions. Whether conviction followed or not mattered little as the effects of press publicity dealing with what were supposedly wilful violations of a beneficent law were most disastrous to those concerned. Such occurrences caused both physicians and druggists everywhere to fear such actions. This attitude may or may not have been justified but it was a very natural outgrowth of the law's administration. At this time, too, were initiated the first public activities directed at relief, through medical investigation and treatment, of large numbers of individuals unable to pay for private treatment—the narcotic clinics which were opened first in

Louisiana and California, and later in a number of other states. More than forty such clinics were in operation from time to time. The whole story of their achievements and failures has never been told; they represented a pioneer movement directed at a solution of certain phases of this complex problem. As in all pioneer movements, they underwent a period of experimentation in which mistakes were made but which eventually, according to their proponents, might have led to valuable findings and encouraging results. Here again, however, the interpretations and enforcement procedures originating in certain regulations of the Department of Internal Revenue in its administration of the Harrison Narcotic Act resulted in their closing before their development could bear fruit through practical administrative and medical procedures. They were declared illegal, and closed. It is claimed by many of the directors of clinics that their closing directly affected the extent of addiction in the communities in which they were conducted. The opportunity to influence individuals to be treated was lost; incurable cases that were being supervised and kept on a minimal dose of drug reverted to larger doses and lost their positions; drug peddlers returned and exerted, as they had before, their influence in spreading addiction among the younger age groups; petty thieving and pocket-picking and other minor crimes, resorted to by addicts of the underworld in order to secure the means to pay the peddlers' prices, were shown by the police records in a number of communities to have reached their former frequency.

The interest of physicians in these cases thus was checked and they even began to refuse to prescribe. Pharmacists also refused to fill prescriptions and chronic users wandered from one to another and finally were forced in order to secure their drug to seek it wherever it could be gotten—from the peddler at his own price. Thus was an illegal substitute for the legal channels of supply created by the law because the law was so interpreted and administered as to render the registered distributors uncertain of their status.

The illicit traffic thus in part stimulated was not to be satisfied with already existing demand, but sought through initiating new individuals to extend its operations—sound business if otherwise disastrous.

Résumé

At the end of the last chapter, we stated that, although informative and valuable within certain specified limits, the so-called mathematical methods of arriving at an appreciation of the extent of the problem of chronic opium intoxication were not exact. We further pointed out that a review of the influences leading to the present situation as presented by available historic record constituted another and satisfactory method of reaching the same objective. Such a review has been given in the present chapter.

In this chapter examination has been made of the chief influencing factors in the development of the problem from the time of the early unrestricted use and popularity of opium to relieve pain through the periods of ignorance of the dangers of continued use, the discovery of its value for other than therapeutic uses, the influences of such writings as De Quincey's and others of his day, the introduction and widespread use of the hypodermic syringe, the influence of the Civil and other wars, the practice of opium smoking, the influence of the patent medicine industry, the discovery and use of heroin, the illicit traffic, and the prevailing lack of interest in the problem resulting in laxness in medical teachings and practice in the employment of opium preparations. These, in general, were the natural factors leading to the increasingly widespread use of opium in all social groups.

Therefore, regardless entirely of the accuracy of the surveys which give rise to the estimates varying from one hundred thousand to more than a million, the actual number of cases is not of such great importance as are the obvious possibilities for the growth of this problem when its causative factors are considered. These are such as to warrant the best efforts of all groups at prevention, alleviation and control.

It must be realized further that each of the above-named factors is by no means simple and direct in its operation; on the contrary, each one is complex and powerful and includes both direct and indirect elements. They are so interwoven with the fabric of our customs, emotions, and acquired knowledge as to have become an integral part of our civilization. For this reason, their importance must be appreciated with the realization that unless they are attacked in all of their rudiments, their influence will continue unchecked. They present a multitude of problems by no means indicated in the above brief enumeration, each one of which requires for its proper determination intensive study from medical, psychologic, sociologic, and possibly other angles. All too frequently their importance has been overlooked in previous efforts at amelioration and control and for this reason, if for no other, the problem appears to have reached its present magnitude.

To the problem and its solution they are as fundamental as is the nature of the condition itself.

Notwithstanding the fact that for lack of space we have been forced to omit a considerable amount of valuable material and that we have touched upon the earlier history only in the most cursory manner, the evidence of a progressive, widespread growth of chronic opium intoxication is convincing, even though every influence mentioned be accorded but a minimal value as an etiologic factor. If one considers the many influences cited in their relation to deep-rooted human instincts and emotions and the general receptivity of an ignorant public, one must conclude without the aid of statistical data of any kind that chronic opium intoxication affects a large number of our people.

CHAPTER III

ETIOLOGY

The importance of the causative factors responsible for such a condition as the one under consideration requires no emphasis. It is patent that in order to succeed all preventive work must be based on an appreciation of such factors. Yet unfortunately few comprehensive studies concerning the etiology of chronic opium intoxication have been made. This apparently is due to the fact that the experiences of individual writers have been limited to one or another class of patients. Thus the prison physician, the alienist and the medical head of a private sanatorium handle very different types and it is quite apparent that studies of such selected groups elicit very different conclusions as to the relative influence of causative factors. No one study of which we have knowledge contains a true cross-section of the opium-using population and it is only by the most careful evaluation of all of them that the truth can be ascertained. In view of the total lack of really comprehensive studies these determining factors should be borne in mind by the reader of what follows.

F. E. Oliver—1871.[1]

From correspondence throughout the State of Massachusetts, Oliver was informed that the "habit" was caused by the injudicious and often unnecessary prescribing of opium by the physician. He adds: "So grave a statement, and one so generally endorsed, should not be allowed to pass unnoticed by those who, as guardians of the public health, are in no small measure responsible for the moral, as well as physical, welfare of their patients."

As further causes the writer mentions depressed conditions of the nervous system induced by occupation, overwork with deficient nutrition, or a vicious mode of life as prostitution and sometimes intemperance. He states that those most generally exempt from this vice are out-of-door laborers and others with occupations allowing an abundance of fresh air and nourishing food. In England, he states, and suspects that it is true also of this country, the opium habit is especially common among the manufacturing classes who are too apt to be indifferent to all hygienic laws. He adds that one of the most frequent predisposing causes is the desire of stimulation which is common in all peoples. The selection of opium in preference to other stimulants is prompted, according to some of his correspondents, by motives of expediency, the facility with which it may be procured and taken without endangering the reputation for sobriety.

---

[1] Oliver, F. E.—The Use and Abuse of Opium—Third Annual Report of the State Board of Health of Massachusetts. January, 1871.

He lays emphasis on one source of the opium "appetite," according to a number of his correspondents, that of its use in infancy and childhood for nursery medication, stating that it is the principal constituent of most of the soothing syrups, such as Winslow's Soothing Syrup.

A. Stillé—1874.[2]

"In some countries where the heat of the climate, or the prohibition of wine by religious enactment, restricts the use of alcoholic drinks, the innate and universal propensity of man to employ some artificial means of promoting the flow of agreeable thoughts, of emboldening the spirit to perform acts of daring, or of steeping in forgetfulness the sense of daily sorrow, has led the inhabitants to seek for those coveted objects in the use of opium. Throughout the whole of Southern Asia, but especially in its most opposite regions, Turkey and China, the consumption of opium for these purposes exclusively is so great as almost to exceed belief. Of late years, also, the habit of chewing opium is alleged to have become very prevalent in the British islands and in the United States, especially since the use of alcoholic drinks has been to so great an extent abandoned by certain classes of people under the influence of the fashion introduced by total abstinence societies, founded upon mere social expediency, and not upon that religious authority which enjoins temperance in all things, in meat and condiments as well as in alcohol and opium. It is true that opium is not likely to become popular among an active and industrious race like the Anglo-Saxon, whose preference must always be for the more potent, though less permanent stimulus, of ardent spirits, the 'gross and mortal enjoyments' of which are far more suitable to the character of that race than the 'divine luxuries' of opium. 'If,' says De Quincey, 'a man "whose talk is of oxen" should become an opium-eater, the probability is, that (if he is not too dull to dream at all) he will dream about oxen;' but men of active mind and warm imagination, as the Orientals generally are, will choose the stimulant which multiplies and gives a livelier coloring to the ideas, rather than that which, acting more especially upon what is merely sensual in man, excites to muscular exertion and boisterous mirth."

---

[2] Stillé, A.—Therapeutics and Materia Medica. 1874.

S. F. McFarland—1877.[3]

"I believe that nearly all the cases of opium inebriety are produced by its medicinal use, and most commonly through the prescription of physicians. At least, during a practice of twenty-four years, I have never known a single instance which did not thus originate. Many a prescription, intended for a day, is continued indefinitely. Several have resulted from the use of patent nostrums—Ayer's Cherry Pectoral, McMunn's Elixir of Opium, and various cough mixtures.'

O. Marshall—1878.[4]

Marshall makes the following statement based on his survey in Michigan:

"The opium-habit in this country sems to arise from many different causes, prominent among which is the indiscriminate use of medicines without intelligent medical advice. Few families are to be found who are without their stock of remedies. Common among these, are opium, morphine, Dover's powder, laudanum, and paregoric, besides the domestic prescriptions containing opium. For the nursery, in addition to the common opiate preparations, are the patent soothing-syrups, cordials and anodynes, nearly all containing opium.

"To show to what an extent the dosing of infants with opiates is carried, it is claimed that over three-quarters of a million of bottles of Mrs. Winslow's soothing-syrup are sold annually in the United States. According to an analysis made and reported in the California Medical Gazette, each bottle of this syrup contains from one-half a grain to one grain of morphine. Placing the average at three-quarters of a grain to each bottle, the amount of morphine used in this manner would be 562,500 grains, or about 1,171 Troy ounces,—enough to kill a half million of infants not accustomed to its use."

* * * * *

"From the predisposition to nervous and neuralgic affections produced by it, probably many cases of the opium-habit in the adult have their first cause in the use of opiates in infancy and childhood. A want is created in the child which is satisfied in the adult when opium is taken, tolerance being already established."

* * * * *

"The most frequent cause of the opium-habit in females is the taking of opiates to relieve painful menstruation and diseases of the female organs of generation. The frequency of these diseases in part accounts for the excess of female opium-eaters over males.

"Undoubtedly in many instances physicians are directly responsible for the habit, in continuing the medicine too long, or too frequently resorting to it; but more often the opiate is prescribed and afterward indefinitely continued without the physician's knowledge or consent. The prescription intended for a day is repeated by the druggist many times, and its use is continued until the habit is formed. I believe there is no effectual law to reach these cases or prevent the sale of opium in any quantity. At present it would not be difficult for a lunatic or a child to obtain at the drug stores all the opium he called for, provided he told a plausible story and had the money to pay for it."

---

[3] McFarland, S. F.—Opium inebriety and the hypodermic syringe—Trans. N. Y. State Med. Soc. 1877, pp. 289-293.

[4] Marshall, O.—The opium habit in Michigan—Annual Report State Board of Health, Michigan. 1878, VI, pp. 61-73.

H. H. Kane—1880.[5]

"The dangers of contracting this habit from the hypodermic use of morphia was recognized in the very infancy of the practice, but was scoffed at or disregarded until a few years ago, when the profession in Germany, England and America awoke, almost simultaneously, to a knowledge of the fact that the habit had become alarmingly common, and that it had been contracted, in the majority of instances, through the carelessness of the physician, who had taught either the patient or his friends how to use the instrument.

"Some of my correspondents, men of ability and in large practice, express themselves as very skeptical of the truth of the statement that the morphia habit has ever been formed by the use of the drug hypodermically. Testimony from all parts of the civilized world settles this matter beyond question."

* * * * *

Kane goes on to say:

"The most important point for the physician to keep in mind is that, in the majority of cases, formation of the habit from the use of the hypodermic syringe is his own fault. When care and discretion are exercised the rule will be for the patient to recover without any desire to continue the use of the drug."

C. W. Earle—1880.[6]

In a report covering a study of the extent of the chronic use of opium in Chicago, Earle makes the following statement:

"In many cases it is difficult to ascertain the reason for taking the drug. The customer buys the preparations he desires and immediately takes his departure; and it is usually a delicate question to ask, 'What do you take it for?' Dr. Joseph Parrish says 'that men take it not for social enjoyment, but for a physical necessity.' With such an opinion I have no sympathy. When it is a physical necessity for men to steal and lie, and murder and partake of alcohol to such an extent as to incapacitate themselves for work, and bring ruin on their families, then I will admit the same in regard to opium-eating. Quite a number, however, freely confess the reason for taking the drug. Eight say that it is for its stimulating and happy effect; four formerly were addicted to drink and seek quietude by taking opium; five are unhappily married; thirty-eight have had rheumatism and are now suffering from it to some extent, and an equal number assign neuralgia as the cause of their pains, for which some form of opiate is taken. Those diseases known by the incomprehensible name of 'female complaints,' are frequently given as the cause for taking an opiate. Previous sickness, and wounds received during the war, painful stumps after amputation, injuries to nerves, etc., etc., loss of property and position in society, are given by a few. But the great majority confess that it was first given during some disease in the course of which pain was a prominent symptom. An opiate was prescribed by the physician, and ever afterward, when suffering pain, the little powder, or laudanum, or gum opium, has become their solace. However much we may desire to avoid this grave responsibility, the truth must be confessed, that the greater number of men and women who are now completely enslaved to the different preparations of opium, received their first dose from members of our profession."

---

[5] Kane, H. H.—The hypodermic injection of Morphia. New York. 1880.

[6] Earle, C. W.—The Opium Habit. Chicago Medical Review. 1880. II. pp. 442-493.

H. Obersteiner—1880.[7]

Obersteiner states that medical men are justly charged with spreading the disease owing to their carelessly leaving morphia and a syringe with the patient and that it appears to be their punishment that many themselves fall victims.

Daniel Jouet—1883.[8]

Jouet states that the two great causes are, as Levinstein first stated in describing the condition, the use of morphin to relieve pain and its use to bring about the euphoria the drug produces.

Besides calling attention to the growing fashion of morphin use by the upper strata of society, Jouet states that as a rule it is in the therapeutic use of the drug to relieve pain and procure calm and rest that the first knowledge of it is formed. It is especially those of nervous temperament and excitable natures who are subject to neuralgias and who become easily familiar with morphin. It is to individuals of the types in whom the intellectual life predominates and who have the greatest tendency to sensual pleasures that the physician is most apt to give the drug for self-administration.

In a table the author lists various conditions for which the drug was originally administered and the number of cases of morphinism caused by each.

Ataxia	32	Prostatitis	2
Sciatica	14	Nervousness	7
Neuralgias	10	Peritonitis	1
Asthma	8	Periostitis	2
Dyspepsia	2	Gastro-Enteralgia	1
Hypochondriasis	4	Pleuritic pains	4
Madness	2	Painful contractures	1
Painful tumors	9	Hemoptysis	1

---

[7] Obersteiner, H.—Chronic Morphinism—Brain. London. 1879-1880. II. pp. 449-465.

[8] Jouet, Daniel—Étude sur le morphinisme chronique. Thèse de Paris. 1883.

"There are omitted from this table a few cases of morphinism due to imitation and one of a physician due to repeated experiments on himself. Given these two major causes of addiction—relief of pain and the desire for agreeable sensations—it is easy to see why the number of morphinists is so large when we consider the multiplicity of painful affections, the ease with which patients may procure morphin, and finally the condemnable indifference in certain cases, of some physicians who are too willing to leave morphin in the hands of their patients."

M. Notta—1884.[9]

"One can become a morphinist in two ways: either by taking morphin internally, in the form of powder, for example, or by absorbing it by the hypodermic method in the form of an injection. It is this last method which is the more widespread and one can only say that the hypodermic injection is the mother of morphinism. But if that is the principal cause, it is not the only one. There is still another guilty one, the physician. Ask morphinists how they contracted this unfortunate habit. Eight times out of ten, the reply is the same; they had a rebellious neuralgia, some illness (often in women pelvic peritonitis) the pain from which could be relieved only by an injection of morphin. The physician always administered it, but one day when he was away, not being able to stand the pain, they administered it themselves. Since then they have continued it, multiplying the injections finding it so easy to relieve the least pain by a little injection and they have developed the taste for it. Now, although cured, they cannot get along without it, they are morphinists! From use to abuse there is only a step and this step is very quickly taken! It is the story of the first cigar; it seems good, or it makes one vomit, one smokes a second, one habituates himself to it, and one becomes a smoker."

J. M. Hull—1885.[10]

Hull, in presenting the results of a survey made by him in Iowa, states:

". . . The habit in a vast majority of cases is first formed by the unpardonable carelessness of physicians, who are often too fond of using the little syringe, or of relieving every ache and pain by the administration of an opiate."

William Pepper—1886.[11]

"Pain holds the chief place among the influences which predispose to the formation of the opium habit. By far the greater number of cases have taken origin either in acute sickness, in which opium administered for the relief of pain has been prolonged into convalescence until the habit has become confirmed, or in chronic sicknesses, in which recurring pain has called for constantly repeated and steadily increasing doses of opiates. In view of the frequency and prominence of pain as a symptom of disease, and the ease and efficiency with which opium and its preparations control it, the remote dangers attending the guarded therapeutic use of these preparations are indeed slight. Were this not so, the number of the victims of the opium habit would be lamentably greater than it is. For these reasons the use of opiates in acute sickness, if properly regulated, is attended with but little danger. Far different is it, however, in chronic painful illnesses. Here to procure relief by opium is to pave the way not only to an aggravation of the existing evils, but also to others which are often of a more serious kind. Opium is at once an anodyne and a stimulant. The temptations to its use are of a most seductive character. To the over-worked and underfed mill-operator it is a snare more tempting than alcohol, and less expensive. It allays the pangs of hunger, it increases the power of endurance, it brings forgetfulness and sleep. If there be myalgia or rheumatism or neuralgia, and especially the dispiriting visceral neuralgias so common and so often unrecognized among the poorer classes of work-people, opium affords temporary relief. The medical man suffering from some painful affection, the worst symptoms of which are relieved by the hypodermic injection of morphine, falls an easy prey to the temptation to continue it—a danger increased by the fact that he is too often obliged to resume his work before convalescence is complete. Indeed, the self-administered daily doses of physicians sometimes reach almost incredible amounts. To women of the higher classes, ennuyee and tormented with neuralgias or the vague pains of hysteria and hypochondriasis, opium brings tranquillity and self-forgetfulness."

---

[9] Notta, M.—La morphine et la morphinomanie—Arch. gen. de méd. Paris. 1884. II. pp. 385-402; 561-583.

[10] Hull, J. M.—The opium habit. Annual Report Iowa State Board of Health. 1885. III. pp. 535-545.

[11] Pepper, William—System of Practical Medicine. 1886.

* * * * *

"The responsibility of the physician to his patient becomes apparent when we reflect that with very few exceptions the opium habit is the direct outcome of the use of the drug as a medicine."

* * * * *

"A predisposing influence of more importance than would at first sight appear is found in sensational popular writings upon the subject. As Kane has well said, 'At the time in which De Quincey, Coleridge, and Southey lived the people and his profession knew little of the opium habit save among foreign nations. The habitues were few in number, and consequently when De Quincey's article appeared it created a most decided impression upon the popular mind—an impression not yet effaced and one which bore with it an incalculable amount of harm. Men and women who had never heard of such a thing, stimulated by curiosity, their minds filled with the vivid pictures of a state of dreamy bliss and feeling of full content with the world and all about, tried the experiment, and gradually wound themselves in the silken meshes of the fascinating net, which only too soon proved too strong to admit of breaking! There can be no question that a percentage of cases of the opium habit, small though it be, is even in our day to be attributed to this cause."

C. S. Schmidt—1889.[12]

After reviewing the growing use of narcotic or stimulating drugs from ancient times down to the present, this author states that the majority of cases arise from the use of morphin to quiet pain but that the euphoria which develops tempts the patient to continue the use of the drug. He emphasizes the psychic effect, stating that in their desire to experience the euphoria patients increase their doses as the effect is lost.

B. H. Hartwell—1889.[13]

On the basis of a survey made in the State of Massachusetts, in answer to a query sent to physicians asking for their opinion as to the cause of an increase in the use of opium, Hartwell reports the following:

"The resolve under which this article is prepared implies, that, if the sale of opium and the evils arising therefrom are increasing, the cause and manner thereof are to be investigated, and remedies proposed; but this investigation, whatever its conclusions, would not be complete without giving the cause of the large sales and extended use of opium, outside of that prescribed by physicians. There are many influences at work to introduce and spread the opium habit. Question No. 2, sent to physicians, asked, of those who thought that the use of opium was increasing, the cause of such increase. About one-third placed the blame wholly or in part upon the medical profession. Unfortunately, the opium habitue frequently gets his first acquaintance with the drug from its employment for the relief of pain; and, not knowing or realizing the evils arising therefrom, either continues it after the visits of his physician have ceased, or resorts to it for ills real or imaginary, without medical advice, and is a slave to it ere he is aware."

* * * * *

"The opium evil is frequently spread by those who praise it as a remedy, the effects of which they know full well; and still further by those who simply recommend it as a reputed remedy for pain. De Quincey tells us that he bought his first opium on the recommendation of a college acquaintance whom he met by accident. The readiness with which opium can be obtained from druggists without prescriptions, or by reduplication of them, forms not a small part of the cause of the large sales and use of the drug; while in part it must be ascribed to that desire for stimulation or sedation which seems to be the outcome of excessive brain work in the pursuit of earth's idols,—wealth and fame. Example serves not infrequently also, non-users becoming victims by merely seeing an intimate friend or acquaintance indulge in the habit. The following are a few extracts from physicians' replies in relation to the cause of the extended use of opium:

---

[12] Schmidt, C. S.—La guérison des maladies produities par l'abus de la morphine. Paris. 1889.

[13] Hartwell, B. H.—The Sale and Use of Opium in Massachusetts—Annual Report Mass. State Board of Health. 1889. 20. pp. 137-158.

"'I think that physicians are too ready to prescribe, and patients are too ready to take morphia and other opiates for the relief of pain, without due regard to the readiness with which the opium habit is formed.'"

* * * * *

"'Habits of luxury and self-indulgence; increased mental and emotional strain in life; greater predominance of the neurotic or neuropathic treatment, and its accompanying craving for stimulants and narcotics; a desire for stimulation and intoxication which can be concealed.'

"'There are several causes, among which are over-mental strain, and all conditions of life which produce insomnia; using it in place of alcoholic stimulants; the common use of the hypodermic syringe, and quack medicines.'

"'Disinclination of people to bear pain; carelessness on part of physicians, who prescribe opium in its various forms without further knowledge as to patient; continuance of drug; and free, unlicensed sale of opium.'

"'Fear that physicians are often responsible; prescriptions are given and patients have them filled ad libitum.'"

G. Pichon—1889.[14]

Pichon investigated the charge that the medical man was responsible in general for the formation of morphinism. He introduces his discussion by stating that formerly the therapeutic use of the drug was the only cause of chronic opium intoxication and that it is even yet the most frequent cause. By leaving the drug and hypodermic syringe with a member of the family or even the patient, opportunity is given for repeated unrestricted use. Added to this is the nefarious rôle of the druggist, all of which results in harm being done before the physician discovers it. The social use, he states, has increased much in the past few years and the expensive and artistic syringes and solution containers that are for sale are quite evidently not manufactured for medical or therapeutic purposes.

In view of the fact that no classes or types of individuals are exempt from the possible development of chronic opium intoxication, Pichon believed it was important to determine what proportion of cases were therapeutic in origin and caused by medical men. He was scrupulously careful in determining this point in his efforts which, he states, he does not conceal were to exonerate the medical man of the charges of carelessness with which he is accused. Unfortunately, he states, the findings of his investigation were far from answering his purpose in this particular. He had thought that in the recriminations directed at physicians there had been much exaggeration. The clinical facts, however, he says, have forced him to admit that on the contrary the generally accepted ideas on the subject are even less than the truth.

---

[14] Pichon, G.—Le morphinisme—Paris. 1889.

From careful investigations he comes to the conviction that medical or therapeutic morphinism is much more common than that from other causes. This is true not only of the older cases but also of those occurring during the last few years, which he says is less excusable as the dangers of morphin and the contra-indications for its use are now well known. But this does not seem to prevent all sorts of carelessness and imprudence. In fact, the author states, the neglect is more common than ever. In arriving at these conclusions he used only cases where the facts and antecedents were well established in order to avoid all criticism.

Out of 55 carefully studied and verified cases of morphinism, 37 were of therapeutic origin. In 34 of these the morphin was ordered by the physician and its use then was neglected entirely and left to the patient himself, a very great mistake. In only three cases was the drug used spontaneously, i.e., without the advice of a physician. In these 34 medical cases, other etiologic factors also entered, according to Pichon.

Pichon states that besides the therapeutic cases there are the euphoric cases described by this term by Fiedler and later by Levinstein. This class of cases, he believes, is unworthy of pity; they are true morphin drunkards. According to Pichon, this type of morphinism holds the same relationship to the other type that acquired syphilis does to congenital syphilis. They first sought the poison and tolerance came later. This division into these two general classes is important from the viewpoint of etiology, symptomatology, and prognosis.

Pichon believes that there are really only these two general causes of morphinism—those of *therapeutic* and *euphoric* origin. The first group may comprise all temperaments and types, as injections of morphin become within a certain length of time a necessity, whatever the type of individual. The second group, on the contrary, would comprise chiefly those who by their temperamental characteristics are drawn toward the unknown and mysterious, to licentiousness if they do not belong to that great class of unstables, abnormals, degenerates, etc., of hereditary origin of whom we have heard so much of late years.

It is in this group that we find intemperates of all kinds as well as the morphinists of euphoric origin.

R. Bartholow—1891.[15]

"Usually the habit of morphinism is formed in consequence of the legitimate use of the hypodermatic syringe in the treatment of disease. Employed in chronic painful maladies for a long period, it is discovered, when an attempt is made to discontinue the injections, that the patient cannot or will not bear the disagreeable, even painful sensations which now occur."

Bartholow divides chronic users into two classes:

"1. Those who take drug as means of intoxication

2. Those who have had morphine prescribed as a remedy and are forced to continue its use after the subsidence of disease."

William Osler—1894.[16]

"This habit arises from the constant use of morphia—taken at first, as a rule, for the purpose of allaying pain. The craving is gradually engendered, and the habit in this way acquired. The injurious effects vary very much, and in the East, where opium-smoking is as common as tobacco-smoking with us, the ill effects are, according to good observers, not so striking.

"The habit is particularly prevalent among women and physicians who use the hypodermic syringe for the alleviation of pain, as in neuralgia or sciatica. The acquisition of the habit as a pure luxury is rare in this country."

William R. Cobbe—1895.[17]

Cobbe reports that out of more than 1200 cases of which he has record, nearly 70 per cent. acquired their condition from medical carelessness.

American Textbook of Applied Therapeutics—1896.[18]

"There seems to be a strong tendency in many, especially of the neurotic class, to the formation of a drug-habit. Some of those, irrespective of medical advice, will resort to drugs to relieve a craving which for the time is most promptly satisfied by other agents of similar nature. A number first learn the potent influence of drugs to soothe their shattered nervous systems from their medical attendant, who perhaps at first carelessly allows them to know what they are taking, and later permits them to use these agents without his supervision. The responsibility of the physician in such cases is great. Better death or invalidism than the contraction of a habit that degrades, demoralizes and finally kills. But the influence stops not here; the products of conception of these drug-habitués come into the world with the imperfections and weaknesses of their parents intensified. The carelessness and indifference with which many physicians administer such drugs as chloral, opium and its alkaloids is appalling. I have known numerous cases confirmed in the opium habit that apparently could lay the cause of their affliction at the door of their good-intentioned physician. All drugs from the repeated use of which a craving may be established should be employed with great caution. The patient should not know what he is taking and should not be able to have the prescription renewed without the knowledge and sanction of the physician. In the majority of instances in which drugs are used, for which a habit is easily formed by some persons, the same agent should not be continued long at a time, but should be alternated with other drugs.

---

[15] Bartholow, R.—A Manual of hypodermatic medication. Philadelphia. 1891.

[16] Osler, Wm.—The principles and practice of Medicine. 1894.

[17] Cobbe, William R.—Doctor Judas, a portrayal of the opium habit. Chicago. 1895.

[18] Wilson, J. C. and A. A. Eshner—American Textbook of Applied Therapeutics. 1896.

"The chief etiologic factor in the development of morphinism is pain, in the broadest meaning of the term—and this may be physical or mental. The next cause in frequency is probably insomnia, with its attendant evils. A large number of morphinists have been, or are at the same time, alcoholics, taking to the syringe after alcohol has been pushed to such an extent that the bodily discomfort produced by over-doses required a stronger and speedier narcotic. From this class of people, moreover, is recruited the largest percentage of drug-maniacs, especially those indulging in habitual dosing with chloral, cocain, etc. In fact, it has been stated that but few cases of pure cocainism have ever been observed. Another class of patients is made up of those of idle and luxurious habits; here the inducement to use morphin is frequently imitation, at times curiosity from reading highly sensational literature (De Quincey, Coleridge, etc.) at other times ennui. Poverty and the misery and deprivations incident to it often lead to morphinism, although the poor are more frequently opium-eaters, it being easier and less expensive to obtain possession of opium than of morphine. Here may be briefly alluded to the fact that a number of patients are started on their downward career by physicians who prescribe or inject the drug recklessly or imprudently. The grave responsibility of the medical profession in this connection is so apparent as to need no further comment."

American Pharmaceutical Association—1903.[19]

The Committee on the Acquirement of Drug Habits of the American Pharmaceutical Association, E. G. Eberle, Chairman, and Frederick T. Gordon, reported as follows on the etiology of chronic opium intoxication.

"A physician is called for the first time to a well-to-do home; a practice might be secured which would be valuable if he can only show his ability, and he does—

---

[19] Eberle, E. G. and F. T. Gordon—Report of Committee on the Acquirement of Drug Habits. Amer. J. of Pharmacy. October 1903. pp. 474-488.

there is not very much pain in the prick of a needle, and the result is so quick, so calming—wonderful man—the patient begins to improve at once.

"Society's whirl demands late hours—a little punch, perhaps salad; sleep must be immediate or the man of business will not get any; there are medicines that will produce it quickly; the prescription can be refilled as occasion demands. The next day a severe headache occurs—no trouble to relieve that, so convenient that many carry it in their pocket, because the headache comes so frequently.

"The man of business must develop the idea which is to yield an extra profit quickly, gain the advantage over his competitor; this may make him nervous, but what of it? That can be remedied by the physician; perhaps he saw an advertisement of a remedy in the paper that would do it, or a friend told him what he is using for the same trouble.

"The pain, irritation, itching, inflammations and other annoyances yield to the influence of some of these delusive drugs; an ointment, a spray, a suppository, all have had their victims."

* * * * *

"The lawyer must have his brain yield its utmost; the preacher must make his sermons interesting; constant strain evidences itself and this must be corrected at once and it can be, and once more they exhibit even greater fluency than before.

"Shall we carry this idea forward to the generation which follows? It is needless; the nursing babe absorbs medicine from its mother's breast as it draws its nourishment; it becomes an habitue with its birth. My mother takes this, I will try a little of it, is another trend of the habit, as well as other association in various walks of life. The negroes, the lower and immoral classes, are naturally most readily influenced, and therefore, among them we have the greater number, for they give little thought to the seriousness of the habit forming.

"I have before me a report from New Jersey; a mother purchased morphine pills several times a week, her son acquired the same habit; another mother takes laudanum, now her daughter does the same. Nearly all report headache remedy habitués; one says if that is a habit, I have about one hundred; I sell about eight gross per year. A Dover's powder habitué was new to me, but knowing the reporter personally, entertain no doubt whatever. Diarrhoea remedies are reported in habitual use by quite a number; one reports a whole family, including young children, addicted. They quickly become morphine and laudanum users. Quite a number report addiction due to physicians in being too ready with the hypodermic injections and suggesting to the patient to send for a few morphine pills. We have many reports expressed in the following, which we copy verbatim from an Indiana letter: 'The most deplorable condition pertaining to the drug habit of late years is that many of the leading lights in the medical profession should become slaves to a vice which they are supposed to combat.' Another writes that quite a number of habitués of his locality lay their acquisition to two physicians who were habitués themselves. This result is natural, but deplorable. The other addictions are ascribed to the use of patent medicines, already described and exhibited in about thirty-eight letters and reports.

"I have not devoted any space to the lower walks of life and will quote two in part. One from Montana reads: 'Most drug fiends of this section come from the Pacific coast. They commence with smoking opium, which becomes too expensive and consumes too much time, so they eat morphine; then they use it by injection because it goes further, then they tip their injection off with cocain because it deadens the pain, and gradually they use more cocain than morphine.' The other report carries with it the same idea relative to morphine and cocain, and says further that cocain fiends are vicious, but that the habit is not as chaining as morphine."

James M. French—1903.[20]

French states that in most cases in this country the habit is acquired by prolonged use of the drug for relief of pain, insomnia, or to quiet alcoholic nervousness.

Stewart Paton—1905.[21]

"The development of this habit depends upon a great variety of conditions and each case needs to be studied by itself. Not a few patients gradually become habituated to the vice from the fact that the drug is too often prescribed for long periods of time, by physicians for the relief of pain in chronic neuralgia, sciatica, insomnia and nervousness, or in women for dysmenorrhoea."

He cites cases where this commonly was done by physicians.

Sir William Whitta—1908.[22]

"Morphinism usually originates in the use of morphia or opium which has been prescribed for the relief of physical pain caused by some functional or organic disease. The relief of the physical suffering, if the latter is continuous or frequent, calls for increasing doses, till in a comparatively short time enormous quantities are necessary for the obliteration of the pain. It is not to the condition which culminates in the capacity for swallowing or injecting these colossal doses that the terms 'Morphinism' and the 'Morphia-habit' are applicable. It is to the craving which the use of the drug engenders that these synonyms should be applied. Long after the disease which first called for the exhibition of the narcotic has passed away, the individual, having experienced the pleasant stimulating effects of the drug, soon finds that he cannot exist without them. As the pleasurable sensations pass off they succeed feelings of lassitude, listlessness, and depression of spirits which call loudly and irresistibly for further stimulation. The morphinomaniac or the victim of the morphia-habit then finds that he is incapable of exercising his brain or performing the ordinary duties of his calling without resorting to his narcotic; this he uses in doses which for the time bring him up to the level of his normal mental and physical vigour."

---

[20] French, James M.—Textbook of Practice of Medicine. 1903.

[21] Paton, Stewart—Psychiatry. 1905.

[22] Whitta, Sir William—Practice and Theory of Medicine. 1908.

R. Dupouy—1912[23]–1922.[23a]

Dupouy cites the history of one family of four members as an example of what is involved in the giving of a hypodermic syringe and the drug by a physician to the patient. All four—father, mother, daughter and son—became chronic users of opium through the same physician. In summarizing the author states:

> "This case is unfortunately not unique, in this same little corner of the world where our confrère—morphinophile and as you have guessed, morphinomaniac—practiced, there can be counted more than two hundred of his patients who have become morphinomaniacs through his attentions."

Ten years later the same author states that the most frequent cause is the prescribing of the drug for painful conditions such as hepatic and renal colic, pelvic pain, rheumatism, asthma, the pain following surgical procedures, etc. Added to the use of morphin in these cases is the fear of pain which the use of the drug creates. This inability to stand pain is a part of the mental make-up of many cases of morphinomania. Such constitutional weakness and psychasthenia, cyclothymia, emotional instability are well known but the therapeutic use of the drug is the more important as without it the majority of these cases would not occur. The causative influence of the initial prescription is seen in a great majority of his cases.

There are doubtless other causes such as the desire to relieve physical or mental suffering, contagion—especially among women—and curiosity in unstable individuals which may act jointly with the first cause.

C. C. Wholey—1913.[24]

> ". . . this brings us as physicians face to face with the ugly fact that perhaps the majority of the morphinists in this country today were first prescribed their drug by a physician. Many histories reveal the appalling truth that the administration of the drug as a medicine was needlessly carried on until habit was formed. Usually, I find the patient has at first been ignorant of the nature of the drug; after he has come to the habit stage there is little use to inform him of the harmful nature of his panacea, for he has found that for him it seems good and he will not consider parting with this drug until he has reached that stage where he finds himself so impaired as to be unable longer to

---

[23] Dupouy, R.—Morphinomanie familiale d'origine thérapeutique. Encephale. 1912. II. pp. 499-501.

[23a] Dupouy, R.—Quelques réflexions sur la morphinomanie. Annales médico-psychologiques. 1922, pp. 453-466.

[24] Wholey, C. C.—Psychopathologic phases observable in individuals using narcotic drugs in excess. Penn. Med. J. June 1913. Vol. 17. pp. 721–725.

hold his own. We find patients who have had given into their own hands the hypodermic needle. The use of the needle practically always insures the formation of the habit."

He also believes that there are two other causes—(1) the passing on of information that opium preparations relieve pain such as dysmenorrhoea, headache, etc., and (2) patent medicines.

James Tyson and M. Howard Fussell—1913.[25]

"The morphine habit is most frequently acquired as the result of long-continued administration of morphine, to relieve some suffering due to a painful or incurable malady or for insomnia. The influence of heredity in favoring the formation of the habit is acknowledged. Neurotic persons are more apt to become its victims. The victim of alcohol often becomes a morphine fiend, being deluded by early experience with the drug to believe that he can thus overcome the previous more disgusting, if not more terrible, habit."

* * * * *

"Too much carelessness is practiced by physicians in placing morphine in the hands of patients to be used at their pleasure. The hypodermic syringe has wrought untold mischief and should never be placed in the hands of patients. On the other hand, when morphine is judiciously ordered for patients suffering extreme pain only, it is very rarely the case that a habit is established."

G. E. Pettey—1913.[26]

Pettey believes that not more than 15 per cent. of drug habitués enter upon the use of a drug as a dissipation, or as a sequence of other forms of dissipation. The remaining 85 per cent. usually are brought into the addiction either inadvertently or accidentally.

Pettey adds that probably 75 per cent. of all laymen addicted to the use of drugs owe their addiction to the indiscreet or necessary use of opiates by physicians. Protracted painful ailments force upon them a condition which they are unable afterward to throw off by their own efforts. These victims of the drug are never willing slaves; they are rebels throughout the entire period of subjugation, and they always hope and look forward to the time when they may be set at liberty.

C. J. Douglas—1913.[27]

"Most physicians are careful, intelligent, and conscientious in the administration of morphine. But there are many individuals in the profession who, through carelessness or a failure to appreciate its dangers, are recklessly prescribing this drug, with the result that morphinism is often acquired, and their patients become helpless slaves. While morphine has a legitimate place in our materia medica, and is a valuable remedy when properly prescribed, yet our best physicians are increasingly cautious in its use, and never employ it except as a last resort. It is humiliating to admit that the widespread prevalence of morphinism is largely due to too careless prescribing by physicians. These prescriptions are often made by well-meaning men, who seem to forget or ignore the dangers and limitations of this drug."

---

[25] Tyson, James, and M. Howard Fussell—Practice of Medicine. 1913.

[26] Pettey, G. E.—Narcotic drug diseases and allied ailments. Memphis. 1913.

[27] Douglas, C. J.—Morphine in general practice. New York Med. J. Apr. 26, 1913.

C. E. Terry—1913.[28]

Terry classifies from the standpoint of cause of original administration 250 chronic users as follows:

Owing to chronic and incurable disease	5	or	2%
From prescriptions of physicians	122	or	48.8%
Through dissipation and evil associates	76	or	30.4%
On advice of friends (not evil associates)	47	or	18.8%

The first and second belong together and were separated to show in how few instances the original malady, for which an opiate was given, persisted and remained a constant cause for its continued use.

Alexander Lambert—1913 [29]—1922.[30]

In 1913 Lambert discusses the subject as follows:

"A further experience with the patients has brought out the striking fact that nearly 80 per cent of those addicted to the use of morphine have acquired their habit through legitimate prescribing by their physicians or by self-medication. This has been due to a lack of realization on the part of physicians that it is by small doses, often repeated over a certain length of time, and not by any definite amount taken for the purpose of acquiring the habit as a luxury or as a vicious self-indulgence, that patients drift into the morphin habit. The patients themselves have failed to realize that if they took morphine even in small doses over a certain length of time, the habit would be fastened on them before they knew it. As the majority of patients have drifted into this habit unwittingly through means furnished by the medical profession, it seems justifiable that we should do all possible to popularize among the profession a method of treatment which with a minimum of suffering can relieve these patients of their unfortunate habit. In the majority of cases when once the morphin habit is acquired, the drug ceases to give pleasure. Often the pain for which it was taken has long ceased to exist; it is continued because of the intensity of the suffering when it is withdrawn. In spite of all statements and beliefs to the contrary, patients cannot break away from this drug of their own volition unless some treatment is at hand to relieve the intensity of the withdrawal symptoms, because of the intense suffering which these symptoms bring."

---

[28] Terry, C. E.—Annual Report Board of Health, Jacksonville, Fla. 1913.

[29] Lambert, A.—The treatment of narcotic addiction. J. Amer. Med. Assn. June 21, 1913. Vol. LX.

[30] Nelson's Loose-Leaf Medicine. Vol. II.

In a survey of the literature from September 1, 1921, to March 1, 1922, Lambert compares the statistics on the etiology of chronic opium intoxication obtained by Dr. Hubbard with his own as follows. As to the source of his statistics, Lambert states that he "recently gathered the statistics of 1,593 addicts from the United States and Canada, drawn from persons in comfortable circumstances of life and occurring in private practice."

"The causation of the addiction as given in statistics dominated by a heroin group, as represented by Hubbard's statistics, is vastly different from that given in Lambert's statistics, dominated by a morphin group. Bad associations were given in Hubbard's statistics as accounting for 69 per cent, and other causes 5 per cent. In private practice, bad associations claim only 24 per cent, illness 71 per cent, and unknown causes 8 per cent. In the latter statistics, therefore, it is undeniable that legitimate medication is a factor in bringing about 71 per cent of the narcotic addiction.

"A detailed study of the causation of drug addiction, based on Lambert's statistics, is of interest. In the cases collected by him 17 per cent of the men and 29 per cent of the women acquired their addiction from physical pain—the pain following operation or injury, the pain of gall stones or renal colic, or the steady grinding pain of headache or neuritis. In only 2 per cent of the women was pelvic pain given as the cause. The pain of rheumatism and gastric diseases accounted for about 2 per cent of the causes in both men and women, and was about 5 times more frequent as a causal factor than the pain of chronic nervous diseases or of heart diseases. Acquisition of the habit through the use of patent medicines is mentioned in a few instances only. Sickness and indefinite pain are given as the cause by 14 per cent of the men and 23 per cent of the women. Asthma is given in 2 per cent of each and mental strain, in the form of worry, unhappiness and sorrow, in 21 per cent of the men and 19 per cent of the women. Overwork and fatigue caused the addiction in 16 per cent of the men and 20 per cent of the women. It would seem from these figures that men bear physical pain better than women—at least so far as seeking relief in morphin is concerned—and the same is true of sickness and indefinite pain. Men, however, succumb more readily to mental strain, and in the quest for relief are especially prone to turn to alcoholism, later turning to morphine to get rid of the first narcotic. Overwork and fatigue are particularly prone to drive men to seek relief in some narcotic, and morphine is apparently very frequently used for this purpose, especially in certain occupations.

"A comparison of the causative factors in relation to the different drugs reveals a noticeable difference in the percentages. Among morphine addicts, 40 per cent of the men and 25 per cent of the women took the drugs for sickness; indefinite pain and bad associations claimed only 13.5 per cent of the men and 8 per cent of the women. Of the 140 taking heroin 81 per cent of the men and

70 per cent of the women took it because of bad associations, but only 6 per cent of the men and 3 per cent of the women took it for sickness. Morphine and cocain addiction was attributed to overwork and fatigue by 32 per cent of the men; of the women taking this combination, none took it for overwork, but 37.5 per cent took it because of the pain following operations, and an equal number because of bad associations. Of those taking morphine and alcohol, 25 per cent of the men took it for overwork and fatigue and 18 per cent of the women for this cause. Sickness and indefinite pain caused 17 per cent of the women to seek relief in this combination and 18 per cent of the men. Bad associations caused the addictions in but 12 per cent of the men and 8 per cent of the women."

P. M. Lichtenstein—1914.[31]

Lichtenstein reports on a study of 1,000 cases[32] representing 5% of the average number of prisoners admitted to the City Prison, Manhattan, during one year. He states:

"As regards the acquisition of the habit, I have ascertained the following: The number of victims who directly trace their addiction to physicians' prescriptions is very small; I have found but twenty such people out of 1,000. Most of these victims were women who had been suffering from tubal disease. One woman had been severely burned and had to be given opiates to quiet her. The information given by physicians to patients, that they had been receiving morphine, cocaine, etc., is to be deplored. Patients should be kept in ignorance as to medication. Other prisoners have stated that they had been induced by friends to take a 'sniff' of the drug, which is variously termed 'happy dust', 'snow', etc.

"Several individuals have come to the conclusion that selling 'dope' is a very profitable business. These individuals have sent their agents among the gangs frequenting our city corners, instructing them to make friends with the members and induce them to take the drug. Janitors, bartenders, cabmen have also been employed to help spread the habit. The plan has worked so well that there is scarcely a poolroom in New York that may not be called a meeting place of drug fiends. The drug has been made up in candy and sold to school children. The conspiring individuals, being familiar with the habit-forming action of the drug, believe that the increased number of 'fiends' will create a larger demand for the drug, and in this way build up a profitable business.

"Many individuals begin taking a narcotic for insomnia; this is particularly true of physicians and nurses. I have treated many nurses addicted to morphine taken hypodermically. Others take the drug to ward off sorrow and care, and still others are compelled to take the drug because of severe pains caused by locomotor ataxia, cancer, etc. The number of young people addicted is enormous. I have come in contact with individuals sixteen and eighteen years of age, whose history was that they had taken a habit-forming drug for at least two years. This includes girls as well as boys."

---

[31] Lichtenstein, P. M.—Narcotic addiction. New York Med. J. Nov. 14, 1914.

[32] The thousand cases include cocain users.

Lucius P. Brown—1914.[33]

Brown states that his investigations indicate that "well over fifty per cent. of existing cases of narcotic addictions are due to the indiscreet administration of drugs by physicians."

Archibald Church and Frederick Peterson—1914.[34]

". . . it is a sad commentary on the heedlessness of some medical men, but the family physician is responsible in almost every case of development of the morphin habit and its far-reaching consequences. It should be looked upon as a sin to give a dose of morphin for insomnia or for any pain (such as neuralgia, dysmenorrhea, rheumatism) which is other than extremely severe and transient."

Clifford B. Farr—1915.[35]

Basing his opinion on observations at the Philadelphia General Hospital, Farr states that in many cases the morphin was taken merely as an indulgence, but other persons attributed it to medication begun either on their own responsibility or on the advice of a physician.

L. L. Stanley—1915-1918.[36] [37]

"The causes of morphinism are many. Foremost perhaps, it is brought about by efforts to combat the distress and ravages of pain. Physicians of the last decade have been too eager to allay pain merely by slight injection of morphine, and, in fact many have not hesitated putting the preparation in the hands of their patients, with the result that people with primarily a minor ailment have been unwittingly put under the defiling influence of this drug.

"Secondly, there are diseases which require opium derivatives not only for the allaying of pain, but for relief from the condition. Asthma may lay claim to morphine as one of its cures. Bronchitis and pulmonary affections demand heroin, while peritonitis and derangements of pelvic organs require a certain amount. Chronic and incurable diseases as cancer, aneurism and some kidney diseases are tided for awhile and rendered more tolerable by the suffering victim.

"Besides pain and disease, there is a nervous strain of modern life, or the 'Mania Americana', which is temporarily relieved by the soothing effects of opium, but which is subsequently made worse by the continued use. Physicians are prone to its use. They are in daily contact with the drug, and although they realize the firm grasp with which it takes them, many endeavor to fling aside their troubles and cares or to stimulate themselves to further efforts by partaking of this hemlock cup. Society women who have undergone a trying season of parties and social functions, ever endeavoring to outrival their neighbor in social splendor, often find themselves wrecked in mind and body. Too often they indulge in opium to calm their shattered nerves. As with the higher classes, so with the lower. Prisons and penitentiaries are filled with fiends, many of whom were produced after they had entered the dismal walls. Almost every brothel has its victims. And even the dweller of the gutter and slum is not exempt. Conditions of life are such, their pains and tribulations are so great that the miserable victim seeks periods of relief and contentment in the use of this death-dealing substance."

---

[33] Brown, Lucius P.—Enforcement of the Tennessee Anti-Narcotic Law. Amer, J. Pub. Health. Vol. 5 No. 4.

[34] Church, Archibald and Frederick Peterson. Nervous and Mental Diseases. 1914.

[35] Farr, C. B.—The relative frequency of the morphine and heroine habits. New York Med. Jour. May 1, 1915.

[36] Stanley, L. L.—Morphinism. Jour. Amer. Inst. Crim. Law and Criminol. 1915-16. VI. p. 586.

Later in 1917-1918, reporting on a study of 100 persons at the San Quentin Prison, Stanley [37] discusses the way in which these prisoners began the use of the drug as follows:

"Knowing the relatively tender ages at which this habit is formed, it is of interest to find out just how the use of dope was begun. To this question there were a great many answers.

"Fifty, or one-half, began by associating with bad companions at night, frequenting dance halls, saloons, poolrooms, and later 'joints' where they were induced to try the pipe. Very few who ever try the pipe have will power enough to refrain from doing the same thing again at some future date when they are importuned to do so by their evil associates. Fifteen per cent were induced and educated to this addiction by women of the underworld, who perhaps took a fancy to the young man and persuaded him to go with her to indulge in this insidious vice. Eleven claim that they learned to smoke opium in jails and penitentiaries.

"In the not far remote periods of the two California penitentiaries it was not difficult to have opium smuggled inside the walls, where men not cured of their addiction would use the drug and induce younger prisoners to be 'sports and take a shot.' At the present time, however, a close watch is kept at the prisons and no contraband is allowed to enter. But at the county jails no such rigid vigilance is in force, and it is said by the prisoners who have come from those jails, that it is a very easy matter for any one who has money to have the drug brought to him. It is in those jails that many a young man is induced to become an addict to this habit because he wishes to show his toughened cell mates that he can be as bad a man as any of them.

"Sixteen others claim that they began the use of dope on account of various sicknesses, such as rheumatism, accidents, syphilis and other forms of disease in which there was a high degree of pain. In some of these cases, it might have been the fault of the physician or of the nurse that the patient found out what he was receiving for his pain and in this way led him on to his addiction.

"One patient examined at San Quentin began by taking paregoric for stomach ache, with which he was troubled to a considerable extent. He was given this by his mother when he was at the age of seven years. From this frequent dosage he acquired the habit, the persistence in which finally landed him in jail. A second addict stated that when he was in high school in a certain town in Nevada, it was a fad among the boy and girl students to visit Chinatown regularly, where they smoked opium. Another told that while in the Alaskan fisheries, he, with a number of other men, was given morphine to stimulate him to greater efforts and to work at higher tension so that all of the fish might be taken care of in a limited time without pecuniary loss to the company. At the end of the season, he was, with a number of other men, a confirmed addict."

---

[37] Stanley, L. L.—Morphinism and Crime. Jour. Amer. Inst. Crim. Law and Criminol. 1917-18. VIII. pp. 749-756.

J. McIver and G. R. Price—1916.[38]

These authors report as follows on an analysis of 147 cases at the Philadelphia General Hospital:

"When questioned as to why the habit of opium-smoking had been formed, all who so used the drug stated that it was first indulged in for pleasure and acquired through association in the 'tenderloin'. Of the morphin users, the largest number, twenty-eight, learned of the effects of the drug through its hypodermic administration by a physician or through a physician's prescription. The next largest number, twenty, first used morphin as an alternate or substitute for opium-smoking. Eighteen acquired the habit through association as a social diversion; ten took morphin for the first time on their own initiative for the relief of pain or insomnia; six used it as a substitute for heroin and five were made victims of the drug while patients in various hospitals in our own city. Of those who used the alkaloid heroin, the largest number, fifty-six, acquired the habit through association. Twenty took heroin instead of smoking opium, or as a substitute for morphin, when these drugs became difficult to obtain. The remaining seven resorted to the drug to relieve the effect of alcoholic excesses, insomnia, headache, etc.

* * * * *

"While these figures prove conclusively that a vast majority of cases of opium-smoking, heroin and cocain sniffing are acquired through association, we would emphasize the fact that the largest single factor in the production of morphinism has been professional medication."

C. B. Burr—1916.[39]

Burr states that he is not prepared to admit that

". . . the majority or more than a large percentage of cases are due to the injudicious prescription of the physician. While some develop because of the continuance of a physician's prescription (often without his knowledge) for an undue length of time, many originate from pure self-indulgence. It is true in all probability that morphine is used too liberally in the treatment of neuralgic conditions. It is too frequently the first resort and one dose is followed by another and another until the patient is under the tyranny of the habit."

---

[38] McIver, J. and G. R. Price—Drug Addiction. Jour. Amer. Med. Assn. Feb. 12, 1916.

[39] Burr, C. B.—Handbook of Psychology and Mental Diseases. 1916.

"A fruitful source of opium and morphine addiction is the presence of one mischievous person who is a confirmed habitué. I have known a whole neighborhood to be infected indirectly by a single individual of this character."

C. E. Sceleth—1916.[40]

"I would call attention to certain rules in the use of morphin by physicians by the observance of which the spread of the habit can be materially restricted. It is a terrible stigma on our profession that in 75 per cent of the cases of chronic morphinism, the drug was first administered by a physician: and that in less than 10 per cent it was not given for its prime indication—incurable pain."

J. Rogues de Fursac and A. J. Rosanoff—1916.[41]

"The study of the etiology of morphinomania involves the consideration of two distinct questions: (1) What individuals are apt to become morphinomaniacs? (2) How does one become a morphinomaniac?

"(1) What individuals are apt to become morphinomaniacs?

"Morphine is no longer, as it was formerly, an aristocratic poison limited to the upper classes. 'Even rural populations are no longer exempt from the contagion; and the fault is chiefly with the physicians.'[42]

"Morphinomania is especially frequent among those who, on account of their profession or surroundings, can readily procure the poison; such are physicians, their wives, medical students, pharmacists, nurses and laboratory attendants.

"As in the case of alcoholism, the character of the soil is here also an important factor. The less energetic and mentally stable the individual is the more likely he is to yield to the seductive influence of the poison. Thus we find that morphinomaniacs are often degenerates.

"(2) How does one become a morphinomaniac? —In many ways, but chiefly:

"(a) Through medication; many subjects receive their first injection for the relief of some painful affection as hepatic colic, neuralgia, or tabes.

"(b) Through curiosity; this occurs especially among degenerates, idlers, individuals who are tired of all ordinary pleasures and are longing for new sensations, and whose unfortunate tendency is still farther stimulated by the example and proselytism of old morphinomaniacs.

"(c) Through the craving for a sedative or for relief from mental suffering; this occurs in the overworked (soldiers in time of war or young people during difficult examinations) and in those who are driven by some misfortune or ill-luck to seek in morphine a consolation for their sorrows and disappointments."

W. A. Bloedorn—1917.[43]

In connection with a report of a study of the drug cases at Bellevue

---

[40] Sceleth, C. E.—A rational treatment of the morphine habit. Jour. Amer. Med. Assn. Mar. 18, 1916.

[41] de Fursac, J. Rogues and A. J. Rosanoff—Manual of Psychiatry. 1916.

[42] Chambard—Les Morphinomanes—Bibliotheque Médicale Charcot. Debove.

[43] Bloedorn, W. A.—Studies of drug addicts. U. S. Naval Med. Bull., 1917, XI, No. 3.

Hospital, Bloedorn says:

> "The number of individuals who begin the use of drugs through illness, insomnia, or persistent pain, while constituting a large aggregate, is believed to form a relatively small percentage of the total. The great majority take their first step through being unfortunate enough to meet and associate with addicts. The recruit is often invited to participate in the use of the drug, and these associates seem never loath to provide him with this means of becoming a confirmed habitué.
>
> "This is particularly true of the large centers of population, and there can be no doubt that overcrowding, congestion, insanitary surroundings, and a lack of the facilities for healthful recreation are predisposing factors in drug addiction. Under these circumstances a drug addict becomes a focus of infection, as it were, and through contact with susceptible individuals serves to spread the evil. With this sort of environment the drug habit is considered to be highly contagious, particularly among minors."

F. X. Dercum—1917.[44]

> " . . . physicians cannot rid themselves of the great responsibility involved in the abuse of morphin, for it must be admitted that it is too frequently prescribed for comparatively trivial affections, and that some physicians are altogether too ready with the use of the hypodermic syringe. Prescriptions for the relief of pain should be for a few doses only."

Carl Scheffel—1918.[45] [46]

Scheffel, after asking the question, "What has the medical profession done to prevent and cure drug addiction?" answers "Very little."

> "We learn from medical history that the medical profession is directly responsible for an overwhelmingly large percentage of drug addicts; from the same source we likewise learn that in caring for these unfortunates medical fads have held, and still are holding sway. Pecuniary interests seem to have crowded out scientific pursuit, and little real good has been accomplished in either the eradication of the habit, or the cure of its victims.
>
> "If such is the state of affairs among those whom we look up to for legal, moral and physical guidance, what can we expect the public to know about these dangerous conditions."

In a later article, Scheffel[47] analyzes the etiology of fifty cases of the chronic use of drugs of which 45 used opium derivatives. The result of this study shows that about 93 per cent. of the cases of chronic opium intoxication were caused either through the inability of the profession to relieve or cure difficult chronic conditions or by the careless and promiscuous administration by physicians of dangerous habit-forming drugs over long periods of time and many times in conditions where these drugs were not absolutely indicated. Only 7 per cent. resorted to the use of drugs entirely of their own accord and not on account of some form of illness for which an opiate was prescribed.

---

[44] Dercum, F. X.—Rest, Suggestion and Other Therapeutic Measures in Nervous and Mental Diseases, 1917.

[45] Scheffel, C.—The victims of habit-forming drugs, from a medical, sociological and legal point of view. Medico-legal Journal, April, 1918, Vol. 35.

[46] Scheffel, C.—The etiology of fifty cases of drug addiction. Med. Rec., Nov. 16, 1918.

[47] Loc. cit.

Scheffel states that it should be emphasized that physicians are making more addicts to these drugs than they would like to admit. In insomnia, etc., it is not justifiable to give these drugs over long periods of time as there are plenty of other therapeutic agents available.

William A. White—1918.[48]

" . . . as in other varieties of narcomania the most important cause is the neuropathic diathesis. In this class of patients the habit is often initiated by the use of morphine to relieve the periodic pains of neuralgia, tabes, dysmenorrhea, rheumatism, etc., or the mental depression incident to worry, loss of position, grief and the like. A great many cases are unfortunately traced to the carelessness of physicians in prescribing the drug, and as if in retribution medical men furnish the largest quota of sufferers (fifteen per cent.)."

Jacob Diner—1918.[49]

"The predisposing causes leading to drug addiction, no doubt, must be looked for, first in the social condition and conditions of labor which obtain among the civilized people. We all know that as civilization progressed the demands upon man became more and more insistent. Greater energy outlay is demanded daily, and to meet these requirements stimulation, either mental or physical, become obvious, nay, become almost imperative. Some of us obtain that stimulation by change of work, by vacations, by hobbies which we enjoy and which give us a mental or physical rest or both. Others, less careful perhaps in the choice of their relaxation, have recourse to the handy but injurious drug.

"Once in a great while the members of the medical profession are the cause of the contraction of the drug habit. It is quite often a relatively easy matter to relieve a suffering patient from pain by the administration of a narcotic. While I fully realize that it is the duty of the physician to allay suffering and cure disease, yet I believe we should lay more emphasis on the latter part of the sentence, that of curing disease rather than to allay suffering. It is for this reason that I wish to emphasize the wrong which the physician commits when he has recourse to the administration of a narcotic for the purpose of easing suffering rather than attempting to analyze the cause of the suffering and removing that cause.

---

[48] White, William A.—Outlines of Psychiatry. 1918.

[49] Diner, Jacob.—Drug Addiction and Its Treatment. Med. Record, Aug. 24, 1918.

"Another and perhaps a most important factor in the promulgation of the use of narcotics has come into vogue recently. As long as the sale of narcotics was not surrounded with so many restrictions and as long as the legitimate use of narcotics was made relatively easy and the obtaining of narcotics for legitimate purposes was within the reach of the suffering public on the one side and within the scope of the prescribing practitioner on the other, there was no special inducement for any man or class of men to increase the use of narcotics. But within recent years, whether necessary or not, a number of laws, intended of course honestly to reduce the abuse of narcotics, have been passed both in the State legislative body and in Congress, and thus the obtaining of drugs has been made relatively, I say relatively, more difficult.

"Because of this increasing difficulty those people who think they have to have the narcotic are willing to pay almost any price in order to obtain it. Commercial history has proven that wherever there is a demand there will be the supply and so, in the case of narcotics, the demand being there it was but a short time before the supply was available. Naturally, of course, that supply was there merely because of the profit there was in it, and the more difficult it was made for the general public or even for the physician to use the narcotic or to prescribe it, the more lucrative was it made for those people to handle it; in fact, it became an inducement for them to increase the use of narcotics by illegitimate means in order to increase their profit."

New York Psychiatrical Society—Public Health Committee, New York Academy of Medicine—1918.[50]

These organizations made a number of recommendations concerning the causes and prevalence of drug addiction, the methods of treatment for relief and treatment for cure and the legislation needed for the dispensing and control of drugs. In regard to the causes and prevalence of drug addiction, the following recommendation was made:

"4. We recommend that a thorough study be made of the extent and causes of drug addiction, such studies for example as will give information as to the age, sex, occupation and environment and the mental and physical condition of victims of the drug habit and as to how their habit was formed.

"With regard to the cause and frequency of the habit, we can make only provisional statements. So far as our knowledge goes, the drug habits formed as the result of long and painful sickness, as the result of painful surgical operations, and as the result of mental causes like sorrow, depression and apprehensive states, constitute at present as in the past, a negligible proportion of the total.

"The habit has largely been formed in recent years by association and imitation by boys and young men and women who are often quite ignorant of the dangers of the habit. Examination of a long series of addicts at Bellevue Hospital shows that about four per cent formed the habit through the advice and prescription of unscrupulous physicians who utilize what is known as the reduction treatment as a cover for their reprehensible practice."

---

[50] Recommendations of the New York Psychiatrical Society and the Public Health Committee of the New York Academy of Medicine. Med. Rec., Mar. 16, 1918.

G. E. McPherson and J. Cohen—1918.[51]

These authors made a study of 100 cases of drug addiction entering Camp Upton, New York. From this survey, they report that

" . . . ten per cent of the 100 men examined attributed their contraction of the drug habit to medication by professional advice. Eighty per cent admitted they were introduced to drugs, by their friends, their friends very largely being immoral women. The social stimulus seemed in a large majority of cases to be the active agent in propagating addiction."

Special Committee of Investigation appointed by the Secretary of the Treasury—1919.[52]

"Data assembled by the committee show that the habit of using opiates or cocaine is acquired through association with addicts, through the physician, and through self-medication with these drugs, or patent or proprietary preparations containing the same. The first two ways in which addiction is acquired are of about equal importance at the present time, the last being of lesser importance in the light of replies received to the questionnaires sent out.

"With respect to this phase of the subject, the committee finds that addicts may be divided into two classes, namely, the class composed principally of addicts of the underworld and the class which is made up almost entirely of addicts in good social standing.

"The addict of the underworld, in a large majority of cases, acquires the habit of using these drugs through his or her associates. This is probably due to the fact that addicts of this class make use of heroin and cocaine most frequently, these drugs being employed as a snuff. It is therefore an easy matter to treat a companion to a sniff of the 'dope.' In addition these drugs are made use of by 'white slavers' in securing and holding their prey, and by prostitutes in entertaining their callers.

"With respect to the addict of good social standing, the evidence obtained by the committee points to the physician, as the agent through whom the habit is acquired in the majority of cases. Some, however, become addicted to the use of these drugs through self-medication while a few first indulge as a social diversion."

Special questionnaires were sent out by this Committee to various

---

[51] McPherson, G. E. and J. Cohen.—Survey of 100 cases of drug addiction entering Camp Upton, N. Y. via draft 1918. Boston Med. and Surg. Jour., June 5, 1919.

[52] Traffic in Narcotic Drugs. Report of Special Committee of Investigation appointed March 25, 1918, by the Secretary of Treasury, Washington, 1919.

TABLE VI *

DETAILS OF QUESTIONNAIRE REPLIES RELATING TO ETIOLOGIC FACTORS

	Cases reported due to given cause					
	Penal institutions (State, county and city)		Almshouses, state hospitals, insane asylums, county and municipal hospitals		Private hospitals and sanatoria	
	Number	Percent	Number	Percent	Number	Percent
PREDISPOSING CAUSES:						
Low Mentality	198	46	924	39	102	15
Nervous diseases	55	13	266	11	195	29
Chronic or painful illness	49	12–	590	25	180	27
Other predisposing causes	125	29	595	25	200	29
Total	427	100	2,375	100	677	100
MANNER IN WHICH HABIT WAS ACQUIRED:						
Through direct administration by physician	64	5	280	11	133	14
Through physician's prescriptions	240	18	364	14	93	9+
Through self-medication or proprietary remedies	18	1	206	8	117	12
Through association with other addicts	974	71+	1,275	48	205	21
Through surgical operations	23	2	160†	6	154†	16
Through other ways	42	3	355	13	270	28
Total	1,361	100	2,640	100	972	100
Number of institutions reporting	126		330		227	
Number of institutions addressed	3,271		5,101		4,568	

---

* This table has been compiled from data contained in "Traffic in Narcotic Drugs," report of a Special Committee of Investigation appointed March 25, 1918, by the Secretary of the Treasury, Washington, 1919.

† In the original report of the Committee, "Surgical operations" was listed among predisposing causes.

groups and among other questions included one requesting a report on the manner in which the "habit" was acquired. The replies to this question are tabulated below.

The committee reports that questionnaires to chiefs of police did not elicit figures but the causes in order of importance were given as follows: Physicians' prescriptions, association with other addicts, prohibition, chronic diseases, curiosity, prostitution, use of patent medicine, use as a stimulant, idleness, use by dentists.

All questionnaires sent to state, county, and municipal health officers brought no figures as to causes but gave the following in order of importance: Physicians' prescriptions, chronic diseases, prohibition, association, use of patent medicines, prostitution, for stimulation, through curiosity.

It should be noted that the above report includes cocain users as no distinction is made between opium and its derivatives and cocain.

M. C. Mackin—1919.[53]

Mackin gives the following as the causes of the misuse of morphin.

First, by administering drugs because of the surgical treatment over a protracted period.
Second, by protracted medication for bodily ailment and disease.
Third, by insomnia.
Fourth, by general ill feeling, sorrow and care.
Fifth, by bad example which is especially true of physicians' wives.

"The chief obsession of the drug addict is to gain converts to the cult. Often the experiment is made 'just for fun' but indifference soon turns to longing. The pleasurable sensation which the injection produces urges to the second injection when the effects of the first have worn off, and thus necessitates in a short time an increase of the dose with a development of the imperious craving.

"This is a craving which causes men to dare all danger, run any risk, forfeit friendship, destroy affection, relinquish honors in possession or in prospect, to associate with criminals, reduce themselves to beggary and those dependent upon them to pauperism, want and wretchedness, expose their families to contemptuous pity, and defy any fate, all in order to gratify this craving."

James M. Anders and John H. Musser—1920.[54]

"The climate, country, and nationality have a certain disposing influence in the development of opiumism and morphinism. In the opium-growing parts of Asia, as in China, India, and Persia, where the climate is warm, enervating, and conducive to physical and moral abandonment during the greater part of the year, and in Turkey also, opium-eating and smoking habitués are as numerous as alcohol habitués are in Europe and America among the Caucasians.

---

[53] Mackin, M. C.—Morphine Addiction. Bull. Iowa Inst., Des Moines, 1919. XXI, pp. 171-176.

[54] Musser, John H. and Anders, James M.—Practice of Medicine. 1920.

"Women are more commonly the victims of morphinism than men, except physicians and druggists as a class.

"Ennui and an idle spirit of irritation and adventure among the sensation-loving and luxurious sometimes sow the seeds of an indulgence in narcotics that bring forth fruitage in the form of a fixed habit.

"The incautious prescribing of morphin and the too ready hypodermic use of the alkaloid by physicians in treating various cases of pain are not infrequently the cause of morphinism. Overwork of the brain, great business or social strains, prolonged worry and anxiety either with or without work, insomnia, remorse, idleness, and secret vices, are the most common predisposing agents of the morphin habit.

"Paregoric, laudanum, chlorodyne, and 'soothing-syrup' are drunk to a frightful extent in large cities among the poor and miserable, and cause great disturbance of the health of the habitués. Heroin is being used to an alarming extent in spite of all efforts to limit its sale."

S. Dana Hubbard—1920.[55] [56]

Hubbard made a study of the cause of chronic opium intoxication in the cases passing through the New York City Narcotic Clinic from which he reports the following:

"Most—in fact 70 per cent—of the addicts, in our clinic, are young people; they have had no really serious experiences—surely none sufficient to occasion a desire to escape all life's responsibilities by recourse to the dreams of narcotic drugs; therefore the one and only conclusion that we can arrive at, is that the acquirement of this practice—drug addiction—is incident to propinquity, bad associates, taken together with weak vacillating dispositions, making a successful combination in favor of the acquirement of such a habit. Being with companions who have those habits, they, in their curiosity give it a trial (similar to the acquirement of cigarette smoking in our young) and soon have to travel the same road to their own regret."

* * * * *

"This appears to vary with localities. Our experience points, in the great preponderance of instances, to bad and vicious associates, 69 per cent from their own statements.

---

[55] Hubbard, S. D.—The New York City Narcotic Clinic and differing points of View on Narcotic Addiction. Monthly Bull. Dept. of Health, City of New York. February, 1920.

[56] Hubbard, S. D.—Some fallacies regarding narcotic drug addiction. Jour. Amer. Med. Assn. May 22, 1920.

"Raising the morale of our public assemblies for the young and making programs in our shops and factories may materially aid in preventing this reprehensible practice.

"Efforts to prevent and avoid mental and physical fatigue in industry with a careful regard for opportunities for acquirement of this habit by the industrially employed is strongly indicated."

Hubbard gives the following table of reasons assigned by addicts for acquiring the habit:

"Bad associates	5,190	69%
Illness	1,994	26%
Other causes	280	5%"

Later Hubbard[56] writes:

"Bad associates and evil environments are the chief causes producing addiction among youthful habitués in this city. Of 7,464 cases observed from April 10, 1919, to January 15, 1920, in the department of health clinic, 3.5 per cent were morphinists, while 96.5 per cent were heroinists."

* * * * *

"The etiology of narcotic drug addiction is not unusual or complicated. It is a natural sequence of indulgence in narcotics for a more or less variable period. The very susceptible acquire the habit in very short periods of time, some as short as ten days (some girls state that after having sniffed three or four times, the withdrawal symptoms were marked); but usually it requires a number of such indulgences. Medically considered, it is thought that any one taking repeatedly a drug for a period of from three to five weeks is in grave danger of becoming an addict. When addiction has been established, it is usually impossible for the individual to discontinue the use of the drug without outside assistance.

"In the clinic, 7,464 cases were cared for; and while gradual reduction (one-half grain every other day) was the custom, yet it was extremely difficult to hold our patients to schedule. A number openly opposed reduction; and when the amount was cut down about half, they left the clinic, not to return, or to return under a different name to commence again at the maximum dosage (15 grains) and pursue another course of reduction. Many were detected doubling in this manner. Of the total mentioned above, less than 2,000 availed themselves of hospital aid, 23 per cent being the actual admissions. This demonstrated that they either feared to undertake a cure or else did not want to be cured.

"There is no conclusion to be drawn regarding susceptibility as concerns age, sex or marital conditions. The statement might also be made regarding race, occupation and other similar factors. The chief direct cause appeared to be evil association, in our experience 96.5 per cent giving this as the cause of the practice."

J. H. W. Rhein—1920.[57]

"Any effort to correct the evils of drug addiction must be based on a thorough understanding of the psychologic factors underlying the cause. I do not believe that mental deficiency is a cause of drug addiction, nor do I believe that the proportion of mental defectives is high among drug addicts. I believe that improper prescribing of opium, morphin or heroin by physicians, while responsible in some degree, is only incidental in drug addiction. I mean by this that the cause of development of the habit is inherent in the individual. The drug addict is a psychopath before he acquires the habit. He is a person who cannot face, unassisted, painful situations; he resents suffering, physical, mental or moral, he has not adjusted himself to his emotional reactions. The most common symptom that requires relief is a feeling of inadequacy; an inability to cope with difficulties. These conditions call for an easy and rapid method of relief which is found in the use of drugs. It is simple enough to cure the victim of his craving temporarily, but the difficulty is in preventing a return to the habit. To cure a drug addict means to reconstruct and reeducate his personality so that he can adapt himself to his emotional reactions."

Ernest S. Bishop—1921.[58]

"There is only one actual origin of addiction, and that is the continued administration of an addiction-developing drug sufficiently long to develop the physical manifestations, symptomatology, and phenomena and body need for that drug."

* * * * *

"The actual origin of addiction is the administration of opiate drugs continuously over a sufficient length of time. The incidental details in their early administration to those who become addicted vary widely. In the origin of some proportion of addicts, we of the medical profession must sooner or later come to recognize and assume our part, unconscious and innocent, but none the less beyond question. What this proportion is is variously estimated by various authorities and statisticians and investigators. It is now beyond dispute that many cases of addiction-disease had their origin in medication during illness, the condition developing unsuspected by either physician or by patient until its physical manifestation had passed the bounds of control."

League of Nations—1923.[60]

The report of the Mixed Sub-Committee of the Health Committee and of the Advisory Committee on the Traffic in Opium,[61] appointed to ascertain, if possible, the estimated amount of the drug specified in Chapter III of the Opium Convention required for the legitimate consumption, contains the following statement:

---

[57] Rhein, J. H. W.—Symposium Philadelphia County Medical Society Meeting. Nov. 10, 1920. Reviewed in Jour. Amer. Med. Assn., Dec. 4, 1920, Vol. 75 (2).

[58] Bishop, E. S.—The Narcotic Drug Problem. New York, 1921.

[60] [61] See following page.

"In Europe and in countries whose customs are similar to those of Europe, the abuse of drugs occurs chiefly as a consequence of their employment for medical purposes."

Henri Claude—1923.[62]

This author distinguishes between constitutional or subjective and accidental or objective causes as follows:

"Constitutional Causes.—There exists a certain hereditary type of neuropathic constitution which hereditary alcoholism often causes. This constitution gives rise to a predisposition to the use of drugs. In intellectual and imaginative types this is characterized by an unhealthy curiosity by a deliberate and intense search for abnormal, unusual or mysterious states. In such predisposed individuals overwork plays a definite role by necessitating strength for excessive effort. In sensitive and affective types this particular make-up involves an excessive impressionability, a tendency to feel too intensely both pain and pleasure. In self-willed types there is aboulia, indifference, laziness, a tendency to obsessions and impulsions. In active, emotional or restless types is found an abnormal desire and need for stimulants, unstable tastes and a sort of instinctive perversion, along with other evidences of mental instability; the perverseness common among the blasés and vicious, prostitutes and 'demi-mondaines.' In these groups the use of drugs is only one symptom among many,—lying, mythomania, sexual excesses, cowardice, meanness, gambling, etc. We will find them among drug users, ordinary unstable individuals, often delinquents of all kinds and also individuals unstable from hypersensitiveness who were formerly classified as high grade defectives. To be entirely correct it must be pointed out that there is a third group of drug users, although a very small one, comprising exceptional individuals who remain immune to drugs, who use them without bad effect for long periods of time in relatively small doses and then easily give up the vice.

"Accidental Causes.—Very often, unfortunately this occurs through medical prescribing. For some pain the physician prescribes an injection of morphin for example; the patient experiences in addition to his relief from pain, a feeling of well-being which induces him to continue the use of the drug even though he is without pain. In a similar situation, Jean-Jacques Rousseau says: 'I do not

---

[60] Report on the Discussions of the Mixed Sub-Committee of the Health Committee and of the Advisory Committee on the Traffic in Opium. January 4-6, 1923. O. C. 86 Minutes of the First Session. C. 79. M. 33. 1923. XI. Annex 3.

[61] This Committee consisted of Drs. Carriere, Director of the Federal Public Health Department, Berne; Chodzko, Minister of Health for Poland; Anselmino, Minister of Health, Berlin; Mr. J. Campbell, Industries and Overseas Department India Office, London:

[62] Claude, Henri.—Sur quelques poisons sociaux; la morphine et la cocaine. Revue Scientifique. 1923. Vol. 61, pp. 509-515.

know of what sickness physicians may cure us, but I know they bring us disastrous ones; when they cure the spirit they kill courage.' It is a fact that a large number of drug users blame professional accommodation—physicians, druggists, dispensaries.

"Very frequently these accidental causes are affective in character. There is some painful happening, a sorrow, a disappointment difficult to overcome, or even simply boredom, anger, a nervous anxiety without cause. Sometimes there are unfortunate social conditions, disgust of daily life, overwork among brainworkers. Finally one of the very common accidental causes of drug-taking is found in the contagion of example; sometimes an interested example, very often disinterested. Proselytism among drug users is well known; thus Thomas de Quincey confided himself to a physician for treatment and ended by converting him to the use of the drug. Sometimes violent emotions play a part; jealousy, the desire to enslave someone else. Sometimes it is a matter of a much more general social custom; the contagion of example operates in friendly assemblages, in gatherings both of the higher and underworld groups. We must not overlook the influence of a certain type of unhealthy literature, of morbid art of which the drama of today affords too many examples.

"Above all at the present time, through the suffering resulting from the war, sensitiveness, especially sentimentality, and fear of suffering have been strongly emphasized in many groups. The habit has been contracted in ambulances, in hospitals, in first-aid relief of pain, nervousness and fatigue. Training in standing pain has been neglected, neither men nor women are accustomed to bearing troubles, mental or physical pain. Along with this fear of pain we must consider the more difficult post-war conditions of living, the stratagems designed to sustain and increase flagging effort, the practise of drugging. In America especially it is said the intense struggle against suffering and for increased strength have increased the use of hypnotics, narcotics, stimulants and stupefacients.

"It is apparent that many influences exist to explain and extend the use of drugs.

"Desire once awakened, the drug habit develops slowly and insidiously; it weakens the will; automatism ensues and the disease results. This disease has been exhaustively studied by Chambard, Dupré and Logre.

"Morphin quiets, cocain intoxicates and excites. According to the need, to the individual conditions of each one will the use of one drug or another be adopted. It becomes a necessity of life. Away from it or without it one is good for nothing. To eat, sleep, work, to be intelligent, to be oneself, the morphin or cocain must be taken. Without it there is mental vacuity, lack of concentration, torpor, discomfort from which come the need of seeking in the drug intoxication the necessary stimulation or the desired relief."

E. Meyer—1924.[63]

"For a long time we have assumed that the basis of the chronic abuse of morphin and other narcotics lay in a psychopathic predisposition or in psychotic deviations of other kinds. Among our 80 cases without an exhaustive study we found at least 50 with nervous and psychic disturbances of different kinds,—some with definite hereditary taint—primarily in the form of psychopathic predisposition of different degrees, often of a degenerative type. Yet among them were also marked mental disturbances,—not only manic tendencies in general but also manic depressive insanity in some cases, about which we were unable to determine whether they were due only to the intoxication or were the manifestations of a manic predisposition. Finally several cases revealed a constitutional defectiveness or imbecility.

---

[63] Meyer, E.—Ueber Morphinismus, Kokainismus und den Missbrauch anderer Narkotika. Med. Klinik. 1924. Vol. 20. pp. 403-407.

"I should like to point out at this time that we should not be misled by the assumption of psychopathic predisposition in every case of chronic abuse of narcotics to employ narcotics without hesitation if a psychopathic constitution is not apparent.

"This caution is the result of my experience, for I know cases in which the physician ordered morphin, even for repeated use, with the explanation that morphinism need not be feared in the given case because of lack of psychopathic predisposition. Care in the use of narcotics should still be maintained in spite of the theory that a psychopathic constitution is a necessary basis for the development of a chronic abuse of the drug.

"In general one is inclined to attribute the origin or rather the production of the chronic use of narcotics to the original therapeutic administration of the drug for the purpose of alleviating pain, producing sleep, etc., in sickness of different kinds, in shocks and in operations and the desire for the drug is developed through its long continued use by the physician or patient. If the statements of the patients could be believed, it undoubtedly would be so. Still all of our patients declare that they had taken morphin or other narcotics on account of pain after a shock or an operation, in diseases such as rheumatism, gout, ischialgia, neuralgia, and especially in diarrhoea, and had developed the desire therefrom.

"The diseases mentioned, undoubtedly because of their chronic or prolonged character, are such as to indicate danger of the development of morphinism on the use of morphin, but the actual proof of severe shock or illness, without knowledge as to whether morphin was given actively, was present in only a fraction, about 10-20%, of the cases.

"We must constantly keep in mind the untruthfulness of our patients, who naturally try to represent their desire as a necessary consequence of their lot in life. Still we have heard from many patients that they had undergone not one illness and operation, but at least a half dozen in a few years which necessitated the administration of narcotics.

"It was also not uncommon for our patients to attribute their desire for the drug to an attempt to avoid the stress of war. In many cases this was true, but in individual cases it would be difficult to prove this cause. Also psychical disturbances of other kinds, unhappy family and matrimonial differences, etc., sometimes were blamed.

"Finally there were a few cases who advanced no special apology, if we may call it such, for taking the drug. In these cases the narcotics were taken for temperamental reasons. These patients were very high grade psychopaths and in general the more severe the psychopathic predisposition the less we could learn of the motive for the abuse of the drug."

* * * * *

"While it is true that in our studies we have been confined to a detailed consideration of the extreme constitutional psychotic deviations, we should remember that there may be other psychic disturbances in the psychotic picture. Some without doubt are reactions of a psychopathic constitution and are psychogenic in nature, but it is often very difficult, indeed impossible, to distinguish them from active toxic disturbances. It should be noted that true morphin intoxication psychoses have not been demonstrated."

S. A. Knopf—1924.[64]

"I protest with all the vehemence possible against the assertion that 'most persons, excepting, of course, the relatively small number of underworld hangers on, and others who use heroine or cocaine because their associates do, become addicted to the use of narcotic drugs as the result of having morphine or other opiates administered to or prescribed for them by their honest, if insufficiently informed family physician.'"

* * * * *

"I have since talked with many colleagues—surgeons, general practitioners and specialists—and only in the rarest instances could they recall any cases where surgical or medical treatment which cured the patient had resulted in drug addiction. As to the hopelessly ill tuberculous or cancerous patient, doomed to certain death within a short time, it would be cruel indeed to let such a one suffer. Judicious administration of opiates to these patients relieves their sufferings and thereby prolongs their lives at the same time. The great and immortal Osler, who was known as a nihilist as far as medication is concerned, called morphine in case of the hopelessly ill and suffering patient the G. O. M. remedy—'God's Own Medicine.'"

* * * * *

"Some years ago, when, beside my tuberculosis service at the Riverside Hospital, there was established a service for the treatment of drug addicts, some committed there by police judges and some who had come by their own desire to be treated, my colleague, Dr. Thomas F. Joyce, was put in charge of that division. From my own observation and inquiries, and from many a consultation with Dr. Joyce, I gained the impression that our profession was only responsible for drug addiction in the rarest instances. Dr. Joyce, whom I recently asked to give his authoritative opinion once more, wrote me as follows: 'In the seven thousand cases that were under my personal supervision at the Workhouse Hospital and at the Riverside Hospital, during the examinations made by me for the etiological factors that led to their addiction, not more than a dozen patients attributed their habit to the injudicious use of narcotic drugs prescribed or administered by the physicians.' "

---

[64] Knopf, S. A.—The One Million Drug Addicts in the United States. Medical Journal and Record, Feb. 6, 1924, pp. 135-139.

William G. Somerville—1924.[65]

"It is not my purpose to fix the responsibility for beginning the habit on anyone. Physicians and druggists have been blamed for it and doubtless in many cases justly, but many take it up themselves to obtain relief from some physical or mental discomfort. It has happened repeatedly that the physician, through ignorance of results, has made morphin addicts of alcoholics by giving hypodermics to relieve the distress following a spree, and it is not surprising that a large percentage of drug addicts were formerly alcoholics."

Carleton Simon—1924.[66]

In connection with a report of a survey of the narcotic problem in New York State, in which questionnaires covering the amount of narcotics used, the number of chronic users treated, and the position of heroin in medical practice were sent to all of the physicians and dentists of the State, Simon states:

"Some medical men have been of the opinion that all that pertains to this subject should be under the jurisdiction of the medical profession; that drug addiction is a sickness or a disease, and the addict should be regarded and treated as a sick man. On the other hand, most of those administering the criminal laws, supported by the great majority of social workers, contend that, because such a large percentage of criminals have acquired the narcotic habit, the issue has become one inseparably connected with the regulation of crime.

"The returns show that there is a medical narcotic addict who requires narcotics because of physical ailments. This type is obviously one to be handled by physicians, and every barrier should be removed so as not to embarrass the physician in according relief to such sufferers.

"The far greater number, however, are the criminal drug addicts whose addiction in its inception and in its continuance is due to vice, vicious environment and criminal associations. The consideration of this class, the figures prove, constitutes a distinct police problem. The so-called medical addict who will not consult the physician, but purchases his narcotics from street venders and thus supports the illicit traffic in drugs, obviously places himself in the same class as the criminal addict. In about 10,000 arrests and hospital commitments for cure by the narcotic division of the police department during the last three years, it was frankly admitted by 98 per cent and a fraction that their addiction was due to bad associations; that there was never any medical reason for their using narcotics. The remaining 2 per cent gave various excuses for first using narcotics, principally some surgical operation or illness. At the time of their arrest there was in this minute percentage almost invariably no reason for their continuing to use narcotics, surely not for the use of heroin and cocain. They buy these on the street, knowing that no reputable physician will prescribe for them. The medical addict usually confines himself to morphin, but the menu of the criminal addict is heroin and cocain. Approximately 95 per cent of those arrested by the police in New York City are heroin and cocain users. In other parts of the country, morphin is the chief narcotic."

---

[65] Somerville, Wm. G.—Who is Responsible for the Drug Addict? Chairman's Address, Section on Neurology and Psychiatry, Southern Medical Association, Washington, D. C. Nov. 12-15, 1923. Discussed by Drs. M. A. Bliss, M. L. Graves, E. Bates Block, Beverly R. Tucker, Tom A. Williams, and D. Percy Hickling. Southern Medical Journal. Feb., 1924. pp. 108-112.

[66] Simon, Carleton.—Survey of the Narcotic Problem. J. A. M. A. Mar. 1, 1924. Vol. 82. No. 9 pp. 675-679.

M. A. Slocum—1925.[67]

In an article dealing with the use of morphin before and after operations, Slocum reports the replies to a questionnaire sent "to 100 leading surgeons." One question, the replies thereto, together with the author's interpretations, follow:

"Question 5.—Do you believe that the routine use of morphin postoperatively is a potent enough factor in causing the patient to become a drug addict, to contra-indicate its use?"

"This question was asked because there are a number of men who fear using the drug, for that reason alone. It seems impossible to estimate accurately what portion of morphin habitués owe their addiction to having been given the drug one or two days after an operation. It can be safely said that the number is negligible.

"There were seventy answers to this question. Sixty-five answered in the negative; four in the affirmative and one felt some doubt on the subject. Further comment on this question is unnecessary, if such a large percentage of men do not fear addiction from this course; therefore, there can be no contra-indication to its use along these lines."

Ministry of Health of Great Britain—Departmental Committee on Morphine and Heroin Addiction—1926.[68]

The report of the Committee [69] considers both the direct and indirect or contributory etiologic factors of opium addiction at some length as follows:

---

[67] Slocum, M. A.—Morphin: its use before and after operations. J. A. M. A. Apr. 25, 1925. Vol. 84. pp. 1264-1267.

[68] Ministry of Health. Departmental Committee on Morphine and Heroin Addiction. Report. His Majesty's Stationery Office. London, 1926.

[69] The members of this committee were Sir Humphry D. Rolleston, Bart., K.C.B., M.D., P.R.C.P., Chairman; Sir William H. Wilcox, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P.; J. W. Bone, M.B., C.M., B.Sc.; R. W. Branthwaite, C.B., M.D., D.P.H.; G. M. Cullen, M.D., B.Sc., M.R.C.P.E.; Professor W. E. Dixon, M.A., M.D., F.R.S.; John Fawcett, M.D., F.R.C.P.; A. Fulton, M.B., B.Ch.; and J. Smith Whitaker, M.R.C.S., L.R.C.P.

"The condition of imperative need just described will only be observed after the drug has been taken habitually. The only immediate cause of addiction is the use of the drug for a sufficient time to produce the constitutional condition that is manifested in the over-powering craving and the occurrence of withdrawal symptoms when use is discontinued. Administration of the drug, however, will lead to addiction much more readily in some persons than in others, and the causes of these differences call for examination. Of such predisposing causes most stress was laid upon inherent mental or nervous instability. One eminent witness emphasized the frequency with which inquiry elicited the history of mental disorder of a more or less serious kind in the near relatives of the patient, and believed that a neuropathic heredity could be traced in many of the cases. Some attached such importance to this factor as to believe that not only could it be traced in most cases of addiction, but might reasonably be assumed to have been present in the remainder. In other words, the continuous administration of the drug would not, they believed, in itself produce addiction in a person whose previous mental and nervous condition was entirely normal. Others, however, while agreeing that persons previously in some degree unstable were more liable than others to become victims of addiction, and furnished the majority of the cases, held that it was possible for a person who had previously appeared free from any indication of mental or nervous instability to become a victim of addiction as the result of prolonged administration of the drug. Moreover, a person whose nervous system is not entirely normal in its working may become an addict through the administration of the drug who would otherwise have escaped. The point is of obvious importance in its bearing on the value of preventive measures, and we therefore feel called upon to state the conclusion to which we think the evidence points, namely, that addiction may be acquired by injudicious use of the drug in a person who has not previously shown any manifestation of nervous or mental instability, and that, conversely, due care in administration may avert this consequence even in the unstable.

"Apart from inherent nervous instability, the liability to addiction as the result of use of the drug may be produced or enhanced by various conditions which include chronic pain of various kinds, especially abdominal, the physical distress caused by such affections as asthma, insomnia, and over-work, anxiety, and other causes of mental distress. Some, indeed, hold that, even in the nervously unstable, one or other of these causes has usually contributed to the production of the habit.

"The following specific events have been regarded by medical witnesses as having immediately led up to the development of addiction in different cases:

(i) Use of the drugs in medical treatment.

(ii) Self-treatment for the relief of chronic or recurrent painful or distressing physical conditions, or for the relief of emotional distress.

(iii) Example or influence of others.

(iv) Curiosity, bravado, and search for pleasurable experience

"We proceed to discuss these separately.

"(i) *Use of the drug in medical treatment* was considered by the witnesses, with but one exception, to have been the immediate cause of addiction in a considerable proportion of the cases they had treated. Some regarded it as the cause in from one-fourth to one-half of their cases, and one thought that it accounted for the majority. In some cases the original object of administration has been the relief of pain due to various causes.

"Some of the witnesses especially insisted that abdominal pain, associated as it so often is with mental depression, is the commonest type of pain the relief of which by drugs leads to the formation of a habit. It was generally held (as already stated) that addiction was more likely to supervene when the drug was administered by hypodermic injection than when it was given by the mouth or the rectum, and that the risk was specially great when such injections were repeatedly given in postoperative and accident cases.

"In many of these cases, it was considered that the drug had been administered injudiciously in various ways, either as regards the doses given, or the period for which administration had been continued, or from lack of care to diminish the doses and make the patient independent of the drug before treatment was concluded. Attention was drawn to the special care needed in the medical use of morphine or heroin in the case of the young, in whom the danger of addiction is usually greater than in older patients. On the other hand, one physician of wide experience expressed the view that some practitioners had been too reluctant to administer morphine in adequate doses at a sufficiently early stage in the treatment of painful and other conditions, with the result that when at last it was given the patient was in such distress and so worn out, and the relief obtained so intense, that there was much greater danger than there would otherwise have been of the formation of a habit. 'The best way,' he stated, 'to avoid addiction ensuing from the medicinal employment of morphine, was thoroughly to relieve pain and to treat insomnia, if present.'

"(ii) *Self-treatment for relief of pain, etc., and recourse to the drug in cases of emotional distress* have undoubtedly been common causes in the past, especially among those whose occupation enabled them to obtain it otherwise than under medical advice. Cases arising in such ways may, however, be expected to be less frequent in future, in views of the restrictions which the Dangerous Drugs Acts have now placed on supply.

"(iii) *Influence of other addicts.*—We have received evidence of cases in which it was believed that the addict had acquired the habit through the influence of other addicts, either by way of direct initiation into the practice or through example. Cases arising from this cause may also be expected to be less commonly met with in future, owing to the gradual diminution in the number of confirmed addicts, and the lessened facilities for obtaining the drug.

"(iv) *Vicious indulgence, and curiosity.*—We have already mentioned cases in which the addiction took its origin in the use of the drug through mere curiosity or search for pleasurable sensations. Such cases appear to be exceptional, and may be expected to become even less prevalent through the operation of the restrictions on supply."

Résumé

In the review of the literature on the etiology of chronic opium intoxication, a general confusion in the points of view from which the various observers approached the subject was noted. A close analysis revealed the fact that the majority of observers appeared not to differentiate between what might be called predisposing or contributory factors and the immediate object for which the drug was taken. It is self-evident that there can be but one direct cause, namely, the continued taking of the drug over a sufficiently long period to produce upon withdrawal distress of some kind to the patient. In their classifications, however, most authors lose sight of the further fact that in any given case of chronic intoxication along with the object for which the drug is taken there may exist one or more predisposing causes, such as the influence of environment, of heredity, of psychopathological tendencies, and the like. The common mistake, therefore, on the part of most writers on the subject consists in using as a basis of etiologic classification incomparable factors. There can be only two effects sought in the use of the drug, namely, therapeutic effect and euphoria but there are many predisposing influences for the continued use of the drug. It is obviously incorrect to name one of these factors, including the objects for which the drug originally was taken and the predisposing influences, as *the cause* of addiction in a given case. All cases should be classified according to two bases:—first, the object for which the drug was taken originally, and second, the predisposing influences, more than one of which may be operative in the same case. The determination of the exact rôle played by each of these factors is a matter for the most delicate analysis and one which has received in previous studies practically no consideration, in spite of its very evident importance in the prevention of needless cases of chronic opium intoxication. The more or less limited or selected experiences of the various individual observers point strongly to the need of a broader and more critical type of approach.

Further a proper evaluation of any data on this phase of the subject requires a knowledge of the basis upon which the individual author has reached his conclusions. If he is reporting a survey or study of individual case histories the reader should be informed as to the technique of the study, including the number and type of cases reported and the method of handling the statistical data. If his conclusion is merely the expression of personal opinion, the author's experiences and first-hand knowledge of the subject should be taken into account.

In connection with the above, there is a lack of evidence that sufficiently long and representative series of cases formed the basis upon which the various authors drew their conclusions. Very few writers have given any figures in support of one or another of the etiologic factors to which they credit the development of their cases. That this lack of data must influence the drawing of satisfactory conclusions is obvious. Presumably intelligent and thoughtful writers would arrive at their opinions as the result alone of observations extending over a longer or shorter series of personal experiences, but the element of fact essential to complete conviction unquestionably is lacking in the vast majority of cases.

While the consensus of opinion of the authors reviewed is that the origin of the majority of cases of chronic opium intoxication lies in the therapeutic use of the drug including both administration by physicians and self-medication, we should remember what has been said of the incompleteness of the data. It is not inconceivable that a greater number of studies carried on simultaneously among larger and more representative groups would have shown not only a different relationship of the etiologic factors within the individual periods indicated but also a variation in the relative importance of each in different periods.

One aspect of the therapeutic administration of opium as an etiologic factor seems to have been lost sight of by many writers. These authors appear to have condemned the medical profession for *all* cases of addiction originating in this manner, overlooking the fact that in many cases the therapeutic use was imperative and indicated by sound, medical judgment under circumstances that could not permit a consideration of a possible, subsequent addiction. Such occurrences are inevitable in the present state of general medical knowledge and should carry with them no reproach, whatever the ultimate result. Cases of this nature must not be confounded with those which could have been prevented by more careful practices.

The second possible object for which the drug may be taken is the euphoric effect. This use of the drug, especially heroin which seems to have become the choice of the underworld, for purposes of dissipation has become increasingly pronounced within recent years. The increased profit derived from the illicit traffic in these drugs co-existing with the enforcement of anti-narcotic laws, appears to have incited the commercial instinct of the peddler to create new patrons through association, environment, etc. The obvious impracticability of securing statistics on this point precludes the determination of the degree of its importance.

A recently developed predisposing influence toward chronic opium intoxication, which apparently has not been recognized by the writers reviewed, may be found in the publicity given to the administration of anti-narcotic laws and to other control measures. This influence may be termed broadly an educational factor and is important in view of its potentialities in stimulating the well-known imitative faculties of more or less unstable individuals who otherwise would not have known of the qualities inherent in the drug involved.

Closely allied in nature to the foregoing is the influence of association and environment on certain types of personality make-up. This may develop accidentally, as through the occupation of the individuals affected (pharmacists, nurses, physicians, etc.), through association with acquaintances who use the drug for therapeutic purposes but who ill-advisedly pass on this knowledge, or through voluntary associations of a vicious nature involving dissipation in many forms and leading to the euphoric use of the drug. The potentialities of this factor are obvious but the degree of its influence is quite unknown.

A factor of importance intimately associated with all of the foregoing as a predisposing influence toward the development of chronic opium intoxication is the personality make-up of the individual. There are certain persons who by reason of definite psychical characteristics more readily become victims of the chronic use of the drugs. This influence must not be lost sight of as whatever the method of exposure, through medical use, environment, or other means, it is present uniformly in the types involved. To determine the relative degrees to which these various co-existing predisposing influences operate is impossible at the present time.

However credible the conclusions reached from the above-mentioned data, the fact that for the most part the evidence is incomplete indicates the urgent need of a carefully conducted study covering a long series of cases and including in its scope all possible etiologic factors.

CHAPTER IV

GENERAL NATURE

Before an examination of what has been written on the pathology of chronic opium intoxication—the somatic and psychic changes brought about in the individual by the chronic use of this drug—attention should be drawn to the opinions recorded from time to time on the general nature of this condition. It is natural that the more or less active consideration of the whole problem has led, especially within the last decade or two, to the expression of opinions on this phase of the subject by all classes of writers. These authors include those qualified by reason of their technical knowledge and experience in handling these cases to speak with authority, as well as those whose limited equipment but keen interest have prompted them to offer their views. Whatever their foundation in fact, it readily may be seen that the free expression of such opinions has played an influential part in shaping current medical and lay conceptions and not infrequently has determined, whether warrantably or otherwise, the treatment of individual cases and public efforts at control. A careful evaluation of the material on pathology presented in the next chapter may assist in a determination of the relative strength or weakness of these opinions.

Just when the chronic use of opium and its train of symptoms first were described we do not know. From the point of view of the development of this practice in Europe and later in America, however, it is sufficient to note that at least from the beginning of the seventeenth century on through what we may regard as the beginning of scientific medicine, opium was employed in the treatment of practically every human ailment and writers called attention to the condition which they variously designated as a vice, habit, appetite, disease, etc.

George B. Wood—1856.[1]

While not attempting to define the condition of chronic opium intoxication, Wood depicts it as follows:

---

[1] Wood, G. B.—A Treatise on Therapeutics and Pharmacology or Materia Medica. J. B. Lippincott and Co. 1856.

"Occasionally the medical man is consulted in this country by the slaves of opium, and has the opportunity of witnessing the consequences of its excessive abuse. In his own therapeutic observation, he also witnesses frequent disturbances must exist in those who use it as a luxury within the same limits. The greatest sufferings, experienced by the opium-eater, are those which attend the state of nervous depression, always existing when its direct influence is no longer felt. There are excessive restlessness, a universal and indescribable uneasiness, feelings of intolerable distress, especially in the epigastrium and lower extremities, an irksome sense, moreover, of incapacity both for intellectual exertion, and for mental or emotional enjoyment, constituting together a state of exquisite misery, from which the only relief is by renewed recourse to the stimulus, which, if taken in an increasing dose, renders him happy again, and again capable of exertion; and thus he goes on, in an alternation of lessening comfort and increasing misery, to the end. At the same time, there is a gradual depravation of the functions, which impairs the degree of health though it may not very materially shorten life, unless the indulgence be carried to great excess. The ordinary derangements of the organic functions are impaired appetite and digestion, habitual constipation, and defective action of the liver; those of the animal functions, tremors, wakefulness, weakened memory and intellect, and loss of interest in the usual concerns of life, and social relations. The lowest stage of degradation has been attained, when the indulgence ends in a total loss of self-respect, and indifference to the opinions of the community; and everything is sacrificed to the insatiable demands of vice. Not infrequently, this habit of excess has been engendered by the supposed necessity of obtaining relief from painful affections, such as cancer, and certain incurable cases of neuralgia; but, though some palliation, this is no satisfactory excuse, for, by proper management considerable relief of pain can generally be obtained, without an excess sufficient to degrade the mind, or even materially the general health; and it is rather a weak yielding to the seductive pleasures of opium, than any necessity for its anodyne influence, that leads to the lowest depths of the evil."

Alonzo Calkins—1871.[2]

Calkins emphasizes the psychologic symptoms of chronic opium intoxication and the moral depravity as evidenced for the most part by oriental opium smokers, describing the condition as a morbid appetite or habit.

E. Levinstein—1878.[3]

According to Harrer's translation of *"Die Morphiumsucht,"* Levinstein takes issue with those who describe the conditions as a "mental alienation" and claims that

---

[2] Calkins, A.—Opium and the Opium Appetite, 1871.

[3] Levinstein, E.—The Morbid Craving for Morphia. Translation of "Die Morphiumsucht" by Charles Harrer.

> ". . . every person, whether of a strong or of a weak constitution, has a tendency towards a morbid craving for morphia if from any disease he has become accustomed to injections of morphia, providing these injections are under his control. Consequently, the morbid craving for morphia injections ranks amongst the category of other human passions, such as smoking, gambling, greediness for profit, sexual excesses, etc. The desire for morphia injections, felt by all debilitated and nervous persons, who lack the power of resistance against it as soon as they have come to appreciate its effects, results from their natural constitution, and not from a certain predisposition for its use."

He further states:

> "To describe the morbid craving for morphia as a mental disease it would be necessary, first of all, to show that the persons suffering therefrom are really impaired in their intellect and feelings. But this is by no means the case. I know a number of sick persons who are suffering from morbid craving for morphia in a high degree, and who, at the same time, are not only in the full possession of their intellectual faculties, but who have risen to, and still hold their place in the foremost rank of science and art. Authorities in military matters, artists, physicians, surgeons, bearing names of the highest reputation, are subject to this craving, without the least detriment to their capacities.
>
> "Surely we cannot deem a person insane whose mind or intellect never, or at least only for a few minutes or some hours, suffers from a slight aberration but who is, on the contrary, mostly absorbed by his art or profession; who fulfills his duties to his government, his family, and his fellow citizens, in an irreproachable manner; and who takes a warm interest in all that gladdens the human heart."

C. W. Earle—1880.[4]

This author expresses the opinion that the opium habit like alcoholic excesses is a vice. He continues:

> "When I say this I am aware that I am expressing an opinion at variance with that believed by the majority of the profession, and one which will be called by many most unscientific. If the eminent gentlemen known as neurologists throughout the land, and those occupying the positions of medical superintendents of inebriate asylums were called upon to cast a pebble in favor of or against this theory, I know full well how the vote would stand. It is becoming altogether too customary in these days to speak of a vice as a disease, and to excuse men and women for the performance and indulgence of certain acts which not only ruin themselves and families, but brings burden on the community, simply because they are not responsible for the act, excuse them because they have a disease.

---

[4] Earle, C. W., M.D.—The Opium Habit. Chic. Med. Rev. 1880—Vol. 2, pp. 442–446 and 493–498.

"That the use of opium for a long time will produce *diseased condition,* I cannot deny. This is true of alcohol. It is true of gluttony. It is true in the case of the old lady who takes an immense amount of tea. It is true of the licentious man or woman. They are all habits frequently followed with dreadful results, and in many cases lingering and incurable diseases.

"That the responsibility of taking the opium or the whiskey, or the gluttonous use of food, in the one, or the use of a stimulating drink like tea in the other, or the undue and unbridled gratification of the sexual passions, is to be excused and called a disease, I am not willing for one moment to admit, and I propose to fight this pernicious doctrine as long as it is necessary."

Daniel Jouet—1883.[5]

"Morphinism is not morphinomania. It is a group of morbid, somatic phenomena due to the continued abuse, for a longer or shorter time, of morphin and constituting a true clinical syndrome."

Constantin Schmidt—1889.[6]

"The condition is known as morphin sickness—*la maladie de la morphine;* other terms as morphinism, morphinomania, etc., designate only certain details of this condition. In considering the subject from a truly humane point of view and without prejudice, according to the principles of psychology, the origin, development and fatal termination of this malady *sui generis,* we must entirely reject the generally prevalent opinion to the effect that this condition is a vice or a luxurious indulgence of certain depraved beings and recognize that it is, on the contrary, a very grave psycho-physical state, and that these patients whose condition is deplorable are worthy of our sincere sympathy."

G. Pichon—1889.[7]

Pichon says that, however initiated, it is well established physiologically and chemically that any organism that has received morphin for a certain length of time requires increasing doses; this is a somatic need. No one, however intellectual, is an exception to this rule.

---

[5] Jouet, D.—Étude sur le morphinisme chronique. Thèse de Paris. 1883.

[6] Schmidt, Constantin.—La guérison des maladies produites par l'abus de la morphine. Paris. 1889.

[7] Pichon, G.—Le morphinisme. Impulsions delictueuses, troubles physiques et mentaux des morphinomanes, leur capacité et leur situation juridique; cause, déontologie et prophylaxie du vice morphinique. Paris. 1889.

Paul Sollier—1894.[8]

Sollier states that the demorphinization of a morphinist consists in setting up in him a true experimental disease which shows a close analogy to what takes place in an infection.

Recent correspondence with Sollier has elicited the following supplementary statements:

> "It is incomprehensible how morphinism can be considered as a simple psychic habit when morphin is a toxic substance which causes in the body symptoms and alterations which bring on degeneration and lead even to death. It is therefore like any other poisoning."

* * * * *

> "Anyone exposed to the prolonged administration of opium or its derivatives may become a morphinist or an opiumist. A neuropathic or psychopathic constitution particularly predisposes to it."

* * * * *

> "In France it is admitted that any person with neuropathic trouble can become a *morphinomane* if he is subjected for any reason at all to the administration of morphin for a period long enough to cause tolerance, but we recognize also that many people have a peculiar tendency to become *toxicomanes* from the fact of their neuropathic or psychopathic condition and to attain it rapidly, which fact does not prevent physicians from administering morphin without first taking into account this tendency."

American Textbook of Applied Therapeutics—1896.[9]

> "Morphinism is a disease both of the body and the mind, caused by chronic poisoning by morphin. When the disease is developed there exists an irresistible craving for the drug, and it is this artificial appetite that is the chief difficulty to be overcome in the treatment."

B. T. Deering and A. Lutaud—1899.[10]

These authors state that they do not subscribe to the theory that morphinism is a psychosis but agree with Levinstein that any individual, no matter how constituted, is subject to the development of the condition when accustomed through some pathologic cause to injections of morphin which they also control. It cannot be placed, they say, in the category of other vicious habits such as the use of tobacco, gambling, etc.

---

[8] Sollier, P.—La Démorphinization et le Traitement rationnel de la Morphinomanie. Semaine Méd. 1894. pp. 146-152.

[9] Wilson, J. C. and A. A. Eshner—American Textbook of Applied Therapeutics. 1896.

[10] Lutaud and Deering—Le traitement de la morphinomanie par la suppression brusque. J. de med. de Paris. 1899. 2 s. XI. pp. 61-63.

William Gilman Thompson—1902.[11]

"Morphinism is an uncontrollable craving for morphine, to satisfy which the patient takes the drug in constantly increasing doses, and sometimes at irregular intervals in large doses, as in alcoholism. . . . Those who have a strong neurotic inheritance are especially the victims of morphinism, and often give evidence of feeble will-power by addiction to other habits; thus the morphine-taker may indulge excessively in cocaine, chloral, opium-smoking, absinthe-drinking, or the use of alcohol in general."

James M. French—1903.[12]

French speaks of the condition as a habit and the patient as an habitué.

Sir William Whitta—1908.[13]

"Morphinism usually originates in the use of morphia or opium which has been prescribed for the relief of physical pain caused by some functional or organic disease. The relief of the physical suffering, if the latter is continuous or frequent, calls for increasing doses, till in a comparatively short time enormous quantities are necessary for the obliteration of the pain. It is not to the condition which culminates in the capacity for swallowing or injecting the colossal doses that the terms 'Morphinism' and the 'Morphia-habit' are applicable. It is to the craving which the use of the drug engenders that these synonyms should be applied. Long after the disease which first called for the exhibition of the narcotic has passed away, the individual, having experienced the pleasant stimulating effects of the drug, soon finds that he cannot exist without them. As the pleasurable sensations pass off there succeed feelings of lassitude, listlessness, and depression of spirits which call loudly and irresistibly for further stimulation. The morphinomaniac or the victim of the morphin-habit then finds that he is incapable of exercising his brain or performing the ordinary duties of his calling without resorting to his narcotic; this he uses in doses which for the time bring him up to the level of his normal mental and physical vigour."

John V. Shoemaker—1908.[14]

"The treatment of chronic morphine poisoning, or opium-eating, is often more moral than medical. In such cases, the will of the unfortunate victim is so weakened by self-indulgence that the acquired taste for the drug cannot ordinarily be resisted, and he will acquire means for its gratification at any cost, or, if it is not obtainable, he may destroy himself."

---

[11] Thompson, W. G.—Text-Book of Practical Medicine. Lea Brothers and Co 2nd. Ed. 1902.

[12] French, J. M.—Textbook of Practice of Medicine. Wm. Wood and Co. 1903

[13] Whitta, Sir William—Practice and Theory of Medicine. 1908.

[14] Shoemaker, John V.—Materia Medica and Therapeutics. 1908.

G. F. Butler—1908.[15]

"Chronic opium-poisoning, resulting from the habitual use of opium, its most active constituent morphine, or its salts, is undoubtedly one of the most pernicious habits to which the human body can be subjected, its mental, moral and physical phenomena being among the saddest and most terrible known to therapeutics."

C. W. Carter—1908.[16]

Carter states that morphinism is not a habit, as habit makes no change in the organism. The use of the drugs stamps an impression upon the organism impossible to be imprinted by the elements responsible for the formation of a true habit. It is not a moral perversion, although it is true that weak, vicious, and degenerate characters more readily lapse into drug abuse. But it is also true that persons of the highest moral type not infrequently become equally subject to narcotic addiction. They are often in no sense perverted. Their ideals may remain as high and their lives in private and before the public as faultless as before addiction began or after it had been abandoned. The moral nature of itself probably plays only a minor rôle in the formation of the condition and, until this is more generally recognized to be a fact, a large part of well meant temperance and reform work will continue to be misdirected and must prove ineffective and a great deal of injustice must be perpetrated upon unfortunate persons. Morphinism is not a disease or an immorality, but a physical or psycho-physical disorder or a condition of disease. Morphinism is not an organic disease, but a derangement of function, a change in the mode of action of the organism, not a change in its structure. It is a condition of auto-intoxication for the relief of whose discomforts morphin is taken, a condition of double poisoning, first and least by the drug, and second and mostly by the toxins of the body itself.

Oscar Jennings—1909.[17]

Jennings states that the "morphia habit" is a "psychosomatic affection" in which the mental and physical troubles are interdependent, conditioned the one by the other.

---

[15] Butler, G. F.—A textbook of materia medica, therapeutics and pharmacology, 1908. 6th ed.

[16] Carter, C. W.—The nature of the morphine disease, Lancet-Clinic, 1908. Vol. 99. pp. 500-502.

[17] Jennings, Oscar.—The Morphia Habit and its Voluntary Renunciation. New York. W. Wood and Co. 1909.

> "Morphia craving which constitutes the difficulty of treatment, is not a pathological entity like malaria or syphilis and curable by agents like quinine, atoxyl or mercury acting on a materies morbi, but a general pathological disturbance caused by the withdrawal of an accustomed stimulant which affects all the functions of the body."

Fürer—1909.[18]

This author describes morphinism as a symptom of an underlying condition rather than a disease entity, as follows:

> "An exhaustive presentation is not possible in a short time. On the basis of 12 years of experience in the observation and treatment of patients in question, the lecturer has formulated a view—different from the usual one—of the essential nature of the so-called abstinence symptoms and of the conditions antecedent to the development of morphinism. According to his experience, a state of nervous exhaustion, even though of slight degree, is, quite apart from the occasional cause, an antecedent condition for the development of chronic intoxication. Morphin now asserts its power by reinforcing these symptoms of nervous exhaustion. When an attempt is made to stop the use of morphin, the symptoms make their appearance in such tormenting form that the resistance of the individual is overcome and the continued use of morphin is forced upon him. Morphinism is, therefore, to be regarded in practice not as a disease but only as a symptom of disease. The withdrawal is only a preparation for the treatment of nervous exhaustion; the latter should be strictly individual and specifically psychic and should take advantage of every means of help which might be applicable. Its final aim should be the orientation of the individual as to the difficulties which have their origin in his own personal disposition and to make terms, so to say, with his personal, i.e. relative, state of health, that he may thus be rendered capable of resisting the complaints which must come in due course. Furthermore, he should as far as possible be enabled, by the arrangement of his mode of life, to avoid too severe nervous exhaustion. Without considering the question as to whether certain symptoms which occur in connection with abrupt withdrawal are to be regarded as abstinence symptoms, the lecturer upholds the view that the disturbances which appear in connection with the only correct—slow and suited to the individual—mode of withdrawal are to be regarded merely as manifestations of the nervous exhaustion. Rejecting the usual definition: 'Abstinence symptoms are the nervous disturbances which occur in the course of a withdrawal, without other etiology, and which disappear at once when morphin is administered,' he sets up the statement—since practically nothing is known as to the nature of the chronic operation of morphin and hence, a scientific explanation of the abstinence symptoms cannot be given: 'Those symptoms which appear in the course of a morphin withdrawal cannot be regarded as abstinence symptoms when we observe them also as functional disturbances in connection with other purely nervous symptoms. The disappearance of these symptoms

---

[18] Fürer: Morphinismus. Neurol. Centralbl. 1909. Vol. 28, pp. 656-7.

through the administration of morphin cannot be a criterion of their nature, since the simple functional nervous disturbances can also be made to disappear by means of morphin.' "

C. L. Case—1910.[19]

Case states that morphinism is a disease as really as is typhoid fever or pneumonia. He further states that there is no structural pathology in morphinism, but that the pathologic changes are entirely of a functional nature, the nervous system is under the benumbing influence of the drug and all vital functions are sluggishly and imperfectly performed. What is commonly spoken of as "the craving" is not a craving at all, but a physical condition.

George E. Pettey—1910.[20]

Pettey points out the teaching that every manifestation of disease has underlying it a "structural pathology" and that writers on drug addiction accepting this as true, strove to demonstrate a structural lesion in drug addiction, but failed, though many still claim it exists. Others took refuge in the general term "neurosis" and, as the nervous symptoms were prominent and mystifying, practical men who attempted to treat the condition symptomatically came to the conclusion that it was incurable and gave up in disgust. Others unable to demonstrate structural lesions took the position that there was no pathology. Confronted with the manifestations attending the use of narcotics, they took refuge in the word "vice," and classed narcotic addiction as a vice, a perversion of the will, a degenerate state into which the victim entered by choice, being prompted or led into it by inherited or acquired degeneracy. They stated that all who used narcotics were primarily neurotics or weaklings, who by using the drugs were made doubly unreliable. They made free use of such terms as pervert, fiend, inveterate liar, etc. Speaking of those who held this view of the condition, Pettey says:

> ". . . . by the very fact of holding such views, totally unfitted to make suggestions for treatment along rational lines. With them, as there was no demonstrable structural pathology, there was no disease to treat, therefore there was nothing left to do but to deal with the patient as one who was dominated by a mere vice, one who was wilfully abandoned to a loathsome habit which he

---

[19] Case, C. L.—The pathology and treatment of the Morphine Habit. Medical Council, 1910.

[20] Pettey, G. E.—A Rational Basis for the Treatment of Narcotic Addiction, N. Y. M. J. Nov. 5, 1910.

could give up by the mere exercise of his will if he chose to do so. Since he did not abandon it, the conclusion was reached at once that he did not desire to do so, that the will was absent, and they forthwith undertook to supply this supposed deficiency by coercion. They advised taking the drug away abruptly and confining the patient where he would be forced to forego its use, that, inasmuch as he did not abandon the use of the drug voluntarily, he should be forced to do so. This course was and is still advised by many, notwithstanding the fact that others who have tried it have wound up with a maniac or a corpse to testify to the success of their efforts."

The author asks how one holding these views would account for the intensity of such symptoms upon withdrawal of the drug, as vomiting, colic, diarrhoea, sweating, labored and deficient heart action, rigors, cold and finally collapse and even death.

Later Pettey says:[21]

> "The essential pathology of narcotic drug addiction (disease) is a toxemia, a toxemia of drug, auto and intestinal origin."

F. McK. Bell—1911.[22]

> "We may describe morphinism as the habit of taking morphine in small doses for the relief of pain and without any appreciable increase in dosage except as necessity demands. . . . Morphinomania, on the other hand, is a condition in which morphine is taken for pleasure or as a stimulant and in ever increasing doses. . . . Morphine not only robs its victim of his physical vitality but leads finally to his mental and moral degradation."

The author emphasizes the mental side, directing attention especially to the visions and hallucinations of the patient, his insomnia, ill-humor, despondency, transitory brilliancy, etc., inability for consecutive mental work, and moral inertia.

Daniel Morat—1911.[23]

Morat states that, regardless of the cause of the condition, morphinism is a true organic disease which must be treated like any other chronic intoxication, moral treatment being of use only to prevent relapse.

---

[21] Pettey, G. E.—Narcotic Drug Diseases and Allied Ailments. 1913.

[22] Bell, F. McK.—Morphinism and morphinomania. N.Y. M.J. 1911. XCIII. pp. 680-682.

[23] Morat, Daniel—Le sang et les sécrétions au cours de la morphinomanie et de la désintoxication. Thèse de Paris. 1911.

Foster Kennedy—1914.[24]

Kennedy states that the sufferer from this disease has too long been the object of contempt of "well-meaning but muddled moralists," and further:

"morphinism is a disease, in the majority of cases, initiated, sustained and left uncured by members of the medical profession. A small number of cases only take origin in love of a new sensation, a novel adventure, and in these morphinism is but a by-product in an individual innately perverted, whose heredity is most frequently of the poorest, and the salvage of whom, apart from his acquired disease, is an affair of doubtful benefit to society."

Speaking of the withdrawal symptoms Kennedy says:

"Against such collapse and pain the unaided will is as powerless as it is to control the amount of air entering the lungs. The analogy is perhaps completely sound, for the deprivation of oxygen results also in the rapid accumulation of poisonous waste against the onslaught of which we have only an acutely limited voluntary control. We have been accustomed to view the morphine addict as a hopeless liar, a moral wreck, a creature sunk in vice, and lost to all sense of decency and honor. He will lie as to the dose necessary to sustain moderately comfortable existence, he will stoop to subterfuge and theft to achieve delivery from his bodily agonies, but there is nothing inherent in the drug to cause his moral degradation in those activities of life in which his addiction has no part. There can be no telling how many sad victims of this disease there may be among people who are of the highest qualities, morally and intellectually, and of the greatest value to their communities, who, if driven by sudden deprivation of their drug and by morphine hunger, might be led to felony or violence to rid themselves of a distress, of the intensity of which there can be no adequate description.

"Such deterioration as sometimes occurs in the morphine addict *malgré lui,* is partly the result of his chronic autointoxication, of which I have just spoken, and largely the reaction to the attitude of his fellows which confounds disease with viciousness and makes of the confessed morphinist a social pariah. Furthermore, this type of patient—who, as has been said, constitutes the vast majority of his species—does not nestle with his vice in secret as has too often been imagined. He seeks aid and cure, and only in despair gives up the struggle, afflicted and misunderstood by his fellows, who, appropriating the functions of a priesthood, look on him, not as a physically diseased entity, but as a moral problem—a brand to be snatched from the flame. Thus morphinism is not an unmoral or a demented, but a physical condition, a diseased state, of the inception of which the sufferer is usually innocent; its symptomatology is exact, and of a constancy not always found in much more clearly understood ailments. Though treatment is beyond the scope of this paper, the majority of cases can be cured, though to the furtherance of this end our attitude must be, not that of parsons, but of physicians."

---

[24] Kennedy, Foster—The effects of narcotic drug addiction. N.Y. M.J. 1914. C. pp. 20-22.

Alexander Lambert—1915–1921[25] [26]

"Morphinism is still looked upon as a vice, deliberately acquired, not as a misfortune sometimes accidentally inflicted on the patient by the physician."

* * * * *

"The sight of the suffering of the drug habitué, his haunting terror lest the drug be taken away from him, his pitiful suffering when it was withdrawn, and the traditional belief in the profession that it was absolutely hopeless to deal with them in any way, combined to awake a keen desire in my mind to search and to see if something could not be found to relieve this misery. Especially did it seem incumbent to do this when I realized how many patients come into the hospital suffering from morphine addiction who had acquired this addiction through legitimate medication, and they were at that time hopelessly condemned to an unhappy and useless existence."

In 1920, he says:[26]

"The morbid process is a functional poisoning resulting in perversion of the functions."

In Nelson's Loose-Leaf Medicine, Lambert, who writes the section on chronic opium intoxication, says:

"It has often been stated, both in lay and medical writings, that the purely physical craving for narcotics is directly inherited. This, today, is a discarded theory, as the facts do not bear it out. The craving is always an emotional impulse often overpowering the so-called will even against the judgment and reasoning endeavors of the personality to resist. Feeble-mindedness is inherited. The weak-willed self-indulgent personality, prone to excess in all things, is inherited. The self-conscious, introspective personality, unable to stand the hard knocks of life, is a personality often transmitted from parent to offspring. In these psycho-neurotic individuals, alcohol and drug addiction is but the expression of the desire for relief from a strain which cannot be borne."

* * * * *

"The intoxication and narcotic impulses, as Trotter expresses it, have been almost universally regarded as either, on the one hand, a sin or a vice, or on the other hand, as a disease; there can be little doubt that in fact it is essentially a response to a psychological necessity. In the tragic conflict between what he has been taught to desire and what he is allowed to get, man has found in alcohol, as he has found in certain other drugs, a sinister but effective peace-maker."

---

[25] Lambert, Alexander—The Intoxication Impulse. Med. Rec. Feb. 15, 1915. V. 87. pp. 253-259.

[26] Lambert, Alexander—The Doctor and the Drug Addict. Symposium. Philadelphia County Medical Society. Nov. 10, 1920.

* * * * *

"The presence in the body of these narcotics produces perversion of the function of many of the viscera, such as chronic constipation and intestinal fermentation, which in turn react upon the disposition and even the temperament of the individual."

* * * * *

"Some patients have been able to take morphine only when recurrent pain has been present, and, seeking safety by never administering the drug themselves, have managed to go for years without really acquiring a habit, which they could not break. If the use of the drug is too long continued, these persons will, in the end, show morphine poisoning, but they never become morphinomaniacs, in the sense of the term as defined by the French, who always show the difference between the morphinist and the morphinomaniac. The real differentiation seems, however, to arise from the different causes which bring about the continued use of morphine, the morphinist being driven by physical pain, the morphinomaniac by psychologic conflict for which forgetfulness is sought."

* * * * *

"Morphin given daily for three weeks or longer, in small doses, almost invariably produces that peculiar narcotic necessity which we designate as the narcotic habit. Some patients may resist longer than others; but the average power of resistance is slight. The habit of morphin-taking is always acquired from small doses frequently repeated. The idea that because the dose is small no habit will follow is an erroneous one which has frequently led to the necessity of habitual use."

* * * * *

"While the psychoneurotic and the inadequate personality break down more completely under the mental conflicts and strains of life and resort more quickly to narcotism than normal persons, all morphine users are not of this type. Many are normal personalities of more than average intelligence and realize fully their position and their progressive degeneration. Such individuals are really filled with remorse and resent the stigma which is placed upon them for a habit for which they are often not responsible."

Solomon H. Rubin—1916.[27]

"Those who come in professional contact with the narcomaniac are convinced that drug addiction is a definite disease having a well defined symptomatology and an indefinite pathology. Indeed, the symptoms of abstinence in almost all cases appear with regularity, in classical order, and so constant as to constitute a definite disease condition which may be easily recognized by the train of symptoms it represents."

---

[27] Rubin, Solomon H.—Drug addiction and modern methods for control. Boston M. & S. J. Nov. 30, 1916, 175, p. 792.

T. D. Crothers—1916.[28]

"The central fact should never be forgotten that drug addictions are distinct neuroses and psychoses, amenable to treatment and curable to an unknown extent."

Again, "the condition of the morphine addict is an assemblage of toxemias and autointoxication, obsessions, delusions and various forms of functional and transient paralysis."

Charles E. Sceleth—1916.[29]

"Too often it is not realized that small continued doses are dangerous; any amount of morphine sufficient to alleviate pain or to ease the patient is enough to create a habit. The contention that normal persons never become addicts in our experience is not true. Even in a strong-willed individual the regular use of narcotic for three weeks can establish the habit; while, after three months of such addiction, it is almost impossible for the patient unaided to discontinue its use."

W. W. Vinnedge—1916.[30]

"As a profession we need a much better acquaintance with the subject than we now enjoy. There is such a close relation existing between drink, drugs and poison, and the connection between insanity and inebriety, which is defined as 'a disease of the will.' Alcohol and drug addiction are to be regarded as examples of the surrender of self-control in favor of self-indulgence; that of the voluntary preference for the lower in the presence of the higher alternative of volition, exercised in obedience to appetite rather than the 'higher command' of conscience."

H. A. Hare—1916.[31]

"Morphine or opium when taken constantly generate a habit. . . . This ability to take large doses depends upon an increased ability on the part of the body to oxidize the poison."

J. Rogues de Fursac and A. J. Rosanoff—1916.[32]

"Chronic intoxication by morphine brings about a condition known as morphinism. Morphinism constitutes morphinomania when the drug has become a necessity to the organism, so that its suppression causes a train of physical and psychical disturbances known as the symptoms of abstinence."

---

[28] Crothers, T. D.—Drug Addictions and Their Treatment. Cincinnati Lancet Clinic. October 23, 1916.

[29] Sceleth, Charles E.—A rational treatment of the morphine habit. J. A. M. A. March 18, 1916.

[30] Vinnedge, W. W.—The ethics and legislation of drug and alcohol addiction. Medico-legal Journal. Vol. 33, May 1916.

[31] Hare, H. A.—Practical Therapeutics, Lea and Febiger. 16th ed. 1916.

[32] Rogues de Fursac, J. and A. J. Rosanoff—Manual of Psychiatry. 1916.

A. Gordon—1917.[33]

Gordon speaks of the condition as a "pernicious habit." In the next paragraph he states:

> "Morphinism usually occurs in individuals with a special make-up of their nervous system. Such persons present deficiency of the intellectual and moral faculties. In them the inhibitory power becomes an easy prey for all abnormal tendencies, particularly for alcoholism, morphinism or cocainism. The latter are results of a neuropathic constitution, the fruit of hereditary tendencies. In handling such individuals, one should remember Ball's dictum to wit. 'Morphinomania is entered by the door of pain, of sexual passion, of sorrow, but also by the door of contagion, viz. imitation.'"

New York Joint Legislative Committee—1917.

The "Preliminary Report on the Joint Legislative Committee appointed to Investigate and Examine the Laws in relation to the Distribution and Sale of so-called Habit-forming Narcotic Drugs, of New York State, 1917," states that lack of understanding and appreciation of the disease of narcotic drug addiction and its treatment by a large majority of the medical profession has fostered conditions which make it impossible to determine a rational procedure for treating and curing the addicted by the state at this time and that such absence of uniformity of opinion has worked great hardship upon the public and has laid the narcotic drug addict open to misconception, misunderstanding, and medical treatment which, in many instances, has resulted in harm rather than good.

The report continues:

> "Evidence offered by physicians shows that many addicts have died under the methods of treatment existing today and that a large percentage of those discharged from institutions as 'cured' are driven back to use of narcotics through unbearable physical torture induced by improper withdrawal of their drug."

* * * * *

> "Your Committee has found that narcotic drug addiction bears no relation in point of character and seriousness to any other known habit induced by the use of stimulants. Narcotic drug addicts according to evidence adduced, should not be classed with the alcoholic or the tobacco addict or the cocaine habitué.
>
> "The constant use of narcotics produces a condition in the human body that many physicians of medical authority now recognize as a definite disease, which diseased condition absolutely requires a continued administration of narcotics to keep the body in normal function unless proper treatment and cure is provided.

---

[33] Gordon, A.—The relation of legislative acts to the problem of drug addiction. Jour. Crim. Law and Crim. July 1917. Vol. 8.

"Withdrawal of the drug of addiction induces such fundamental physical disorganization and unbearable pain that addicts are driven to any extreme to obtain narcotic drugs and allay their suffering by self-administration."

The Committee states that it held hearings in New York, Brooklyn, Buffalo, Syracuse, and Albany, that it gathered a large amount of testimony from those charged with the distribution of narcotic drugs and those responsible for the enforcement of the laws in respect to the sale and use of such drugs, that it received assistance from members of the Judges and Justices Association of the State of New York, from members of the medical profession associated in drug addiction work, in the penal, charitable and correctional, institutions of the state, and from laymen and members of the pharmaceutical profession. Among individuals mentioned especially as having assisted the Committee were Drs. Alexander Lambert, E. S. Bishop, Charles Rosenwasser, James F. Rooney, F. C. Graham, and George E. Pettey. The report was signed by George H. Whitney, Chairman, George R. Brennan, R. M. Prangen, John J. Boylan, and Maurice Bloch.

Walter A. Bloedorn—1917.[34]

"The public is still inclined to regard these cases as a group of mental, moral and physical defectives, who, through some inherent weakness, have been predestined to fall by the wayside and who, if not actual criminals, are potential criminals. They are described as lacking in all the virtues and possessing innumerable vices and as being constant offenders against the law. In fact, the law itself stamps them as criminals for it provides penal servitude for anyone having the drug in his possession unlawfully and naturally the addict has it in his possession daily. This provision of the law, while appearing excellent at first glance, acts at times as a boomerang."

He further states:

"An examination of these cases at close range does not bear out the statement often made that drug addicts belong to the so-called criminal class. It is true that when the drug has come to be a necessity for the addict, the importance of obtaining enough of it every day overshadows everything else in his life, and in order to obtain the drug he has little hesitancy in lying or stealing. These traits are developed and become engrafted in the direct proportion that they become necessary to secure the desired relief and are not the result of inherent criminal tendencies. In other words, the individual is not an addict because he has criminal tendencies but rather he develops criminal tendencies because he is an addict."

---

[34] Bloedorn, W. A.—Studies of Drug Addicts. U. S. Naval Medical Bulletin. 1917.

"It is a psychological fact that a habit once firmly established over a number of years cannot be uprooted and thrown aside by treatment covering a period of weeks or months. It has become engrafted upon the individual and constitutes a part of his very being. His resistance to this act has been broken down and it is not only easy but it is the natural thing to happen that he should go back to this habit upon the slightest provocation."

C. B. Pearson—1918-1919.[35] [36]

Pearson apparently considers as equally important and indicative of the nature of chronic opium intoxication both the pyschic and somatic manifestations. He states:

"Many of the medical profession rightly regard morphinism as a disease. A few laymen are of the same opinion. Unfortunately, not a few physicians and the majority of the laity regard morphinism and opiumism as faults. When an organ of the body or portion of an organ is changed in structure or fails to properly perform its functions, we have disease. When there is an actual change in structure we call the disease an organic disease. When there is only a derangement of function we call the disease a functional disease.

"Morphinism and opiumism belong in the latter class of diseases. Many medical men look upon morphinism as a disease, but hold the addict responsible for the continuation of the disease because he does not discontinue the use of the drug. If a relatively large minority of addicts discontinued the use of the drug through their own unaided efforts and of their own volition, we might very justly hold the majority responsible for not doing likewise. As a matter of fact, less than one-tenth of one per cent ever thus succeed in freeing themselves from the clutches of the drug.

"There is only one rational explanation of this fact, and that is that the drug itself has certain peculiar properties and effects upon the body and mind of the victim that makes any attempts at discontinuance a matter of intense physical and, more especially, mental suffering. The mental stress and depression are not only horrible in the extreme, but they also unman the addict to such an extent that he is in no condition to bear the physical suffering."

The author further states[36] that some consider morphinism a toxemia, others a neurosis, others a psychosis. It is all three plus other changes; the glands of the body are affected, how much we do not know; metabolism is interfered with; organic functions are interfered with; nutrition is seriously affected and all of these and other changes must be taken into account in the treatment of cases.

---

[35] Pearson, C. B.—Is morphine "Happy Dust" to the addict? Medical Council. December 1918 and January 1919.

[36] Pearson, C. B.—A study of the etiology and prophylaxis of relapse in morphinism. Med. Rec. June 21, 1919.

George D. Swaine—1918.[37]

Swaine emphatically denies that chronic opium intoxication is a disease but states rather that it is "a condition, a disorder resulting from chronic narcotic poisoning plus an established toleration for the drug, and complicated by an ever present dominating fear."

C. L. Dana—1918.[38]

"In drug addiction there is a morbid condition of metabolism which arouses a very uncontrollable need for opium. This may be called a disease or not according to one's fancy in the use of words. It may be there is a functional defect or perversion of the endocrine and vegetative nervous system. Drug addiction is a vice, or moral or mental defect, in the sense that the condition is often deliberately or stupidly acquired and persisted in."

Special Committee of Investigation appointed by the Secretary of the Treasury—1918.

The report of this committee, signed by Henry T. Rainey, Chairman, Reid Hunt, B. C. Keith, and A. G. DuMez, but not by the fifth member of the Committee, Pearce Bailey, states:

"In reply to the question relative to the nature of drug addiction, 425 health officials stated that the physicians in their communities regarded it as a disease, while 542 reported that they regarded it as a vice."[39]

Elsewhere in the report appears the following:

"The constant use of narcotics such as opium, its preparations and alkaloids produces a condition in the human body which is beginning to be looked upon by physicians as a disease. This diseased condition requires the repeated administration of the drug of addiction to keep the body functioning normally or the institution of medical treatment. The mere withdrawal of the drug induces such fundamental disorganization and such painful disturbances that addicts are driven to any extreme to procure more of the drug with which to allay their suffering."

Again, in speaking of the growth of the problem and the public indifference to it, the report states:

"In many cases it is no doubt partly due to the more or less general acceptance of the old theory that drug addiction is a vice, or depraved taste, and not a disease, as held by modern investigators. This attitude has had the effect of holding these unfortunate creatures up to public scorn, and thereby lessening any interest in their welfare."

---

[37] Swaine, G. D.—Regarding the Luminal Treatment of Morphine Addiction. Amer. Jour. Clinical Medicine. 1918. p. 610-611.

[38] Dana, C. L.—Problems of Drug Addiction. Medical Record. Feb. 2, 1918.

[39] It should be noted that cocain users were included in all questions and figures.

S. E. Jelliffe and W. A. White—1919.[40]

"The habitual use of opium in some form has become common among all classes of society. The same thing may be said with reference to the reasons for taking opium as has been said with reference to alcohol. The opium habitué is a person primarily of neuropathic taint, the mere opium taking or the symptoms it produces being but surface indications of the real trouble."

C. F. J. Laase—1919.[41]

"It is no longer justifiable to speak of drug addiction as being a habit, a vice, a degeneration or perversion of the mind. It is a distinct, definite physical disease condition with definite uniform manifestations and phenomena and a definite understandable causation."

He says, reviewing the tolerance of these cases, that in balance they are normal in every respect but that withdrawal may lead to collapse and death.

"These signs and symptoms are as constant, uniform and recurring as those of any other disease."

He states that the old views of vice and habit do not explain these happenings or the fact that a baby born of an addicted mother is addicted and will die unless an opiate is administered. He accepts the theory that the continued administration of the narcotic drug causes the establishment of a protective mechanism or certain antidotal substances in the blood, and that these are poisonous when not antagonized by the drug itself.

American Medical Association, Council on Health and Public Instruction—1920.[42]

The report of the Committee on the Narcotic Drug Situation in the United States appointed by the Council on Health and Public Instruction of the American Medical Association and, according to our best information, composed of Drs. E. Elliot Harris, Chairman, A. T. McCormack, Paul Waterman, and Alexander Lambert, ex-officio, states:

---

[40] Jelliffe, S. E. and W. A. White—Diseases of the Nervous System. 1919.

[41] Laase, C. F. J.—Practical Application of the Facts of Narcotic Drug Addiction Disease. Medical Record. Aug. 9, 1919.

[42] J. A. M. A. May 8, 1920. p. 1324-1328.

"We think it is also apparent that the habitual users of narcotic drugs may be divided into two classes. In Class 1 we shall place all those who suffer from a disease or ailment requiring the use of narcotic drugs, such as cancer, and other painful and distressing diseases. Patients in this class are legitimate medical cases, and the physician should be ever mindful that his patient should protect him by not sharing the drug with others.

"After excluding Class 1, we have left for consideration those who are addicts—those who use narcotic drugs for the comfort they afford and continue their use solely by reason of an acquired habit. In this class we have those who are suffering from a functional disturbance with no physical basis expressed in pathologic change."

* * * * *

"We turn to the consideration of the persons classified as addicts after excluding all those who suffer from a disease calling for the use of narcotic drugs, and with the conviction that we are dealing with functional conditions for which the remedy is the withdrawal of the drug. On the basis of the testimony we have submitted in this report we suggest the following subdivisions of Class 2, in which we include addicts as just defined:

1. Correctional cases
2. Mental defectives
3. Social misfits
4. Otherwise normal persons."

J. H. W. Rhein—1920.[43]

Rhein does not agree with those who claim that mental deficiency is a cause of chronic opium intoxication or that the proportion of mental defectives is high among such cases. He believes that the cause of the development of the condition is inherent in the individual, who, he says, is a psychopath who cannot face unassisted painful situations, who resents any suffering either physical or moral, and who has not adjusted himself to his emotional reactions.

E. S. Bishop—1920.[44]

"We find that we are dealing fundamentally with a definite condition whose disease manifestations are not in any way dependent in their origin upon mental processes, but are absolutely and entirely physical in their production, and character. These symptoms and physical signs are clearly defined, constant, capable of surprisingly accurate estimation, yielding with a sureness almost mathematical in their response to intelligent medication and the recognition and appreciation of causative factors; forming a clean-cut symptom-complex peculiar to opiate addiction."

---

[43] Rhein, J. H. W.—The Doctor and the Drug Addict—Symposium Philadelphia County Medical Society Meeting, Nov. 10, 1920. J.A.M.A. 1920. Vol. 75. p. 1589-1591.

[44] Bishop, E. S.—The Narcotic Drug Problem—1920.

"My present definition of narcotic drug addiction is as follows: a definite, physical disease condition, presenting constant and definite physical symptoms and signs, progressing through clean-cut clinical stages of development, explainable by a mechanism of body protection against the action of narcotic toxins, accompanied if unskillfully managed by inhibition of function, autotoxicosis and autotoxemia, its victims displaying in some cases deterioration and psychoses which are not intrinsic to the disease, but are the result of toxemia, and toxicosis, malnutrition, anxiety, fear and suffering.

"To express this somewhat differently—a narcotic drug addict is an individual in whose body the continued administration of opiate drugs has established a physical reaction, or condition, or mechanism, or process which manifests itself in the production of definite and constant symptoms and signs and peculiar and characteristic phenomena, appearing inevitably upon the deprivation or material lessening in amount of the narcotic drug, and capable of immediate and complete control only by further administration of the drug of the patient's addiction."

* * * * *

". . . the tendency and effect of legislative, administrative, police and penological activities in general have been to place the sufferer from addiction-disease in the position of the criminal and vicious. The tendency of the psychologist and psychiatrist is to analyze him from the viewpoint of mental weakness, defect or degeneration, and to so classify and regard him. The average practitioner of internal medicine, and even the recognized leaders and authorities in this field of medical science, will tell you that narcotic drug addiction is a condition to which they have given but little attention and have no clean-cut ideas of his physical disease problems. The addict himself, whose testimony has been all too little consulted or sought, will tell you that he is sick with some kind of a physical condition which causes suffering, incapacity, whenever a sufficient amount of narcotic is not administered.

"In the above attitudes and statements the administrative, police and penological authorities are right in some cases;—the psychologists and psychiatrists have a good basis for their opinions in some cases;—the addict has physical grounds for his statement in all cases—he is always sick, sick with addiction-disease."

I. H. Neff—1921.[45]

"It has often been asked whether drug inebriety can be considered a disease. This has been questioned, as the term disease has never been accurately defined; whether we accept the theory that drug addiction once established is due to an antidotal toxic substance in the blood, or whether we regard it as a manifestation of an inherent defect with an unknown pathology, is foreign to our present consideration; it is sufficient to recognize drug addiction as the name of a clinical syndrome, requiring an accurate differentiation and a specialized and distinctive treatment directed to the individual case. . . .

"For clinical purposes we may consider that drug addiction is a symptom complex, not a clinical entity, the drug taking episodical and precipitated by exciting causes of physical or mental origin, given a susceptible subject, crises may develop after any marked departure from ordinary routine (mental) or any disturbance of organic nature (physical). By the acceptance of this theory as a working basis we can readily appreciate the vagaries and inconsistencies which are so pronounced in the drug user and we will be able to meet the symptoms with a better understanding as to the underlying causes. If we recognize this description of the drug addict we are prepared to oppose those who would conveniently label the syndrome a 'habit' which can be corrected by the patient; there can be no argument as to the habit of mannerism, however; the believers in such theory are faulty in their reasoning, as they fail to recognize the importance of valuing the neurotic state responsible for the habit."

---

[45] Neff, I. H.—The Case of the Drug Addict. Jour. Mich. State Med. Soc. March, 1921. xx. 79-83.

W. P. Butler—1921.[46]

"Morphinism is the same everywhere, yet opinion differs as to what it really is. It is variously considered as a vice, a crime, a disease, a purely mental condition, a pathological condition, something that can voluntarily and easily be quit by the user if he wants to quit it, and some say it is a sociological and legal problem, while still others contend it is a medical problem primarily. No matter what different persons may call the condition, the patient is a sick person, and as such is entitled to and should have proper consideration, care, and treatment, either for the causes that are responsible for his being an addict, or for the addiction itself."

Eugène Gelma—1922.[46a]

This author's conception of the nature of chronic morphin poisoning is covered in what follows:

"Morphinism is the psychosomatic state of an individual given to the continued use of morphin or opium; no poisoning from habitual use is comparable to morphinism; while tobacco, alcohol, ether, and even cocain habits may be controlled with relative ease and quickly, or at least without causing serious consequences of any kind, the special state in which the morphinist finds himself and *which is more than a habit,* cannot be remedied in a day. The morphinist acquires a new state of being, his organic personality is changed; the equilibrium of certain functions of the vegetative nervous system is disturbed, the patient, so to speak, is out of accord with his normal biologic status; he is, to use a figure of speech, *remonté d'un ton,* (keyed up) and if he does not wish to suffer, often beyond all description, by the change to normal tone, he must remain on the ration of morphin or opium that has become necessary. The general health, the visceral functioning, the psychic faculties of acquisition and assimilation, disposition, affectivity, emotion, and the possibility of intellectual work and habitual activity, cannot be maintained in the morphinist except with his usual dose of poison, accustomed as he is to the abnormal condition which in reality in his case constitutes an indispensable stimulant, a support of all of his organic, neuro-sympathetic and cerebral functions.

---

[46] Butler, W. P.—Report Louisiana State Board of Health Narcotic Dispensary and Institutional Treatment Department, January 1, 1921.

[46a] Gelma, Eugène—De quelques particularités sur la morphinomanie et la démorphinisation. Gaz. méd. et rev. d'hyg. soc. de Strasbourg. April, 1922. Vol. 80. No. 4. pp. 143-148.

"Morphin therefore is a necessity for the morphinist, a vital necessity. This statement is not too strong. It does not constitute an emotional satisfaction, the gratification of a pleasure, as those unacquainted with this unfortunate condition state; it only gives a feeling of support to the vital forces, to the maintenance of the equilibrium of cenesthesia, that is to say, to the harmony of the many feelings, vague or definite, connected with the viscera, the bony structures, the skin, etc., which emanate from all tissues and of which the total is the foundation of obscure consciousness and of instinct.

"Morphinism therefore is an inexorable need of morphin. Privation of morphin, the diminution of the accustomed ration, puts the patient into an indescribable state of discomfort which is called 'morphin hunger.' Then appear signs of morphinism which are completely unperceived by others as long as the dose is maintained in the necessary and sufficient quantity."

C. E. Sandoz—1922.[47]

"Enough has been said to show that the morphine habitué having withdrawal symptoms feels very miserable and is sick. Nevertheless, it will be useful to dwell on this point, because a certain skepticism towards this sickness is often met with. Even if the sickness is acknowledged, the idea is too often expressed that it is due simply to a desire for the drug which could be overcome by the display of will-power. This error is based partly on ignorance of the facts, but there is another source for it. There are all degrees between the cases in which the symptoms do not go beyond a certain discomfort and those in which they are so severe that death ensues. Furthermore, any case begins with light symptoms. Now, as long as the suffering is moderate, the patient can pull himself together and refrain from exhibiting too much distress. He does so, too, if it is in his interest, as when it is a question of not betraying that he is a morphine habitué. It is also true that the average case is a weakling who has a tendency to whine and to exaggerate his symptoms, especially if he knows that by so doing he will obtain relief or pity. This being granted, it should not blind us to the fact that most withdrawal symptoms cannot possibly be created by a mental attitude. The wildest desire or craving for anything else has never been observed to cause a condition resembling that of a person suffering from withdrawal symptoms from morphine. Besides, the following facts show clearly that we have to deal with a disease condition which has its root in bodily changes:

"1. In every case, the symptoms are in the main the same, so much so that from these symptoms alone, provided one is familiar with them, the diagnosis can be made.

"2. People who have acquired the morphine habit and do not know about withdrawal symptoms sometimes do not realize that the latter are due to the want of the drug when they try to stop its use, but will attribute them to some other cause and perhaps consult a physician. Ocassionally, in these cases, the physician himself does not suspect or recognize morphinism and interprets the symptoms as due to some other disease condition.

---

[47] Sandoz, C. E.—Report on Morphinism to the Municipal Court of Boston. Jour. Crim. Law and Criminol. May, 1922.

"3. Certain animals can be chronically intoxicated by morphine and, when injections are discontinued, they develop withdrawal symptoms similar to those in men.

"4. When a pregnant woman uses morphine, the drug circulating in her blood goes over into the child's, so that babies of morphinist mothers show, some hours after birth, withdrawal symptoms identical with those of adults and which are often so severe that they die. Furthermore, cases are on record in which morphine, habitually taken by the mother after the birth of the child, has created in the latter a condition of morphinism which manifested itself by withdrawal symptoms when feeding at the breast was discontinued.

"5. Whatever may be the intensity of the withdrawal symptoms, no matter how long they have lasted and whether they are recognized as such or not by the patient (as in the case of newly born babies), a sufficient injection of morphine will bring about their prompt cessation and a feeling of well-being. The relief, and especially the duration of the relief, is roughly proportional to the dose given. One does not succeed in deceiving the patient by an injection of some indifferent solution.

"This possibility of removing at any time any withdrawal symptoms by means of a new dose of morphine is a further point which should always be kept in mind when the question of morphine addiction is discussed. It is a well-nigh irresistible inducement for the addict who suffers from withdrawal symptoms to give up his decision to leave the drug alone."

* * * * *

"The question, 'Is morphinism a vice or a disease?' is often raised, but is obscured or its issues are confused by the moral feelings involved. Now the definition of morphinism, not only in medical parlance but according to Webster, is a 'morbid condition produced by the habitual use of morphine; morphine habit.' In the first meaning, morphinism is by definition a 'morbid condition,' *i.e.*, a disease. In the second, we must realize that when there is a morphine habit, *i.e.*, when morphine is taken regularly, the disease condition described before necessarily develops. The more inveterate the habit, the more marked, as a rule, the disease condition will be. Morphinism, then, is always a disease and must be considered as such. The only question which can logically be asked is: 'Is it a vice besides?' Vice means, among other things, 'indulgence of degrading appetites,' 'state of being given up to evil conduct or habit,' 'a physical taint.' It is plain that, in all these acceptations, morphinism is a vice as well. We can, then, say that morphinism is necessarily both a disease and a vice at the same time. But vice has, also, the meaning of 'moral failing' or 'wickedness.' Is morphinism a vice in this sense? If it is, is it always so and in the same degree? This is a moot point closely linked with another question: 'Is morphinism brought about by a vice or by a disease?'"

Medical Society of State of New York—Committee on Narcotic Drugs—1922.[48]

"Your Committee does not consider drug addiction as a disease entity, but rather as a habit similar to the excessive use of any other stimulant or sedative, as coffee, tobacco, etc. The question is the character of the stimulant or sedative used by the habitué. Functional disturbances of the internal organs follow acute excesses or prolonged use of these drugs. These conditions can be cured, but the fundamental psychopathic state is not cured by cutting off the drug, hence a relapse to the former habit when opportunity offers."

The members of this Committee were E. D. Fisher, Chairman, E. B. Angell, E. A. Sharp and W. Timme.

L. C. Scott—1923.[49]

"Pertinent to both the legal and medical viewpoints of the narcotic problem is the question which is so often asked and so often evaded—'Is drug addiction merely a habit or is it a disease?' The confusion and difficulty in answering this question is due to lack of definition of terms, what is meant by 'habit' and what is meant by 'disease.' According to the Century Dictionary a 'habit' is a customary mode of action which is instinctive, unconscious and uncontrollable. 'Disease' is a deviation from the healthy or normal condition of any of the functions or tissues of the body.

"Huxley's definition is even more broad and comprehensive. He says 'Disease is a perturbation of the normal activities of a living body.' If we concede the truth of the following premises; viz.: that morphinism or drug addiction is a customary mode of action and that furthermore it is uncontrollable, we must also accept the conclusion that it is a habit and, secondly, we must agree that inasmuch as disease is deviation of the normal functions of the body, and that the manifestations of drug addiction indicate at once that these functions are disturbed, we must conclude that it is a disease. Therefore, it is both a habit and a disease; but arguing by analogy we can easily prove that habit may readily act as the provocation of disease. For instance, epithelioma of the lip or carcinoma of the tongue are assuredly diseases. It is possible that they may owe their origin to pipe smoking. But pipe smoking is a habit, therefore, lip and tongue cancers are habit diseases. Again, overeating may lead to a long series of organic defects including arteriosclerosis and an apoplectic stroke. Overeating is surely a habit, and an unnecessary one. Its logical outcome is arteriosclerosis and apoplexy, that is disease and its manifestations—ergo, habit diseases.

"Another point of view which seems equally as logical is that the state called 'morphinism' or 'drug addiction' is one in which the body finds itself when its physiology is disturbed, without the administration of some foreign substance not normally necessary. In the sense of the above definition this constitutes disease, for without morphin, which is beyond doubt an abnormal substance in the metabolism of the human body, there is 'a deviation from the healthy and normal condition.' Let any one look at an individual suffering from withdrawal symptoms and argue that the bodily functions are intact.

---

[48] New York Medical Society, E. D. Fisher. Report of the Committee on Narcotic Drugs. Presented at annual meeting of the Medical Society of State of New York at Albany, April 18, 1922. New York State Journal of Medicine. May 1922. Vol. 22, No. 5. pp. 221-2.

[49] Scott, L. C.—The Case of the Drug Addict. Quarterly Bulletin Louisiana State Board of Health. March, 1923. Vol. XIV No. 1. pp. 14-18.

"Another contention that morphinism is not a disease is that there are no pathological changes visible. In short, it is a habit because the microscope does not reveal cellular alterations. Has any one detected cellular alterations in the earlier stages of hebephrenic dementia or paranoia, or hysteria? But who will question for one moment that they are manifestations of disordered bodily functions, and therefore disease entities?

"Then we come to the conclusion that it is neither flesh nor fish, yet sometimes one, sometimes both; either a habit or a disease or finally a disease condition caused by a habit which has become fastened upon the body because of disease. We argue in a circle, grasp fallacy after fallacy and in the end are little wiser than when we commenced."

Sir W. H. Willcox—1923.[50]

"The taking of a narcotic drug of addiction for a few doses may be termed a vice, but if the administration is continued for a month or so a true disease condition becomes established, with a definite pathology and symptoms.

"The drug addict, provided that he has a certain allowance of his drug, is an individual on a low plane of physical health. The complexion is sallow, he is emaciated, and there is evidence of a general lack of function of the secretory organs. The mental symptoms are shown by weakness of character and will, and lack of moral sense.

"In some cases a drug addict may show even to an experienced observer few, if any, abnormal signs. The opium or morphine addict, if having his necessary allowance of the drug, may conduct himself normally from the moral and social point of view; and where the daily amount is small he may, for extensive periods, carry on his work in life. The cocaine addict undergoes a more rapid deterioration, both mentally and morally, and is apt to perform criminal acts.

"The 'withdrawal symptoms' of addiction disease are most characteristic. The sudden stoppage of the drug leads quickly to characteristic symptoms which are both physical and subjective or mental. These have been well described by Dr. Harry Campbell in his recent able paper on morphine addiction read before this Society (April, 1923).

"The objective symptoms—feebleness of the heart's action, tremors, vomiting, purging, and sometimes actual collapse—are unmistakable. In addition there are subjective symptoms, such as pains in the limbs and body of a distressing character. The mental symptoms experienced by the patient are those of restlessness and extreme mental suffering.

---

[50] Willcox, Sir W. H.—Norman Kerr Memorial Lecture on Drug Addiction. Brit. M. J. Dec. 1, 1923. No. 3283, pp. 1013-1018.

"The withdrawal symptoms are at once relieved by a dose of the drug of addiction. The prevention of withdrawal symptoms in a confirmed morphine addict can be worked out with almost mathematical accuracy. Thus in a given case a minimum amount of morphine can be determined which will, for a certain number of hours, prevent the development of withdrawal symptoms. Such symptoms are usually less marked with cocaine than with morphine and heroin, but in severe cases of cocaine addiction of long standing it is a mistake to assume that withdrawal symptoms do not occur; they may be quite marked and even serious.

"Withdrawal symptoms of addiction disease are now accepted as forming a definite symptom-complex of characteristic type. They are not symptoms which are purposely assumed by the patient with the object of obtaining a further dose of the drug. The objective symptoms described are a sufficient proof of this.

"The experimental production of morphine addiction disease in dogs, and the manifestation of a similar symptom-complex of withdrawal symptoms, have furnished additional evidence that drug addiction is a true disease condition. A most interesting case of symptoms of morphine withdrawal in a newly born infant has been published by Dr. L. A. Van Kleek in America."

* * * * *

"In this case it was clear that the child suffered from withdrawal symptoms of addiction disease on the second, third, and fourth days of life. It also appeared evident that the addiction disease was transmitted from mother to child. Sufficient morphine to prevent withdrawal symptoms was present in the milk of the mother, who continued to have her usual daily allowance of morphine. The above case is strong evidence that drug addiction is a real pathological condition or disease."

C. C. Wholey—1924.[51]

"The observation of a routine series of approximately 1,500 narcotic drug addicts, many of whom were persons of superior intelligence, convinces me that this is essentially a neuropsychiatric problem. The greater number of habitués have drifted into narcotism because of inherent mental instability; the majority of all addicts have become victims during adolescence, before character, even in normal youth, could become stabilized. A small minority have succumbed through therapeutic necessity. The acquiring of the habit is only in rare instances a matter of individual responsibility. Such facts, viewed in connection with the deep-seated and intricate invasion of the personality by the drug, make it clear that decisions as to curability and as to treatment are for the physician. Drug addiction is at present an outstanding social problem. It is only through scientific and unprejudiced understanding of the matter that society can be protected against this insidious menace, with its increasing army of inadequates and their train of poverty and crime. Society will have to approach this problem in the end as other disease problems have been approached; we eliminate typhoid, not by putting responsibility up to the individual, but by abolishing the source of infection. Drug infection, as well, will have to be attacked at its source, whether that source lies in the greed of individuals or in that of governments."

---

[51] Wholey, C. C.—The Mental and Nervous Side of Addiction to Narcotic Drugs. J.A.M.A. Aug. 2, 1924. Vol. 83. pp. 321-324.

William G. Somerville—1924.[52]

"We now know that drug addiction is a disease, a pathological condition, just as much as the psychoneuroses of any of the various toxic states. To be more exact, I would say that drug addiction, or the craving for opium or its derivatives, is as much a symptom of disease as pain is of peritonitis and pleurisy, and as headache is of meningitis.

"While physical or mental pains are the most frequent causes of one's beginning the habit, yet the drug addict has a disease per se, separate and distinct from the disease or condition for which he sought relief in drugs. He has become, so to speak, infected, just as a simple wound may be infected with tetanus bacilli. In one who has used morphin for a month or more in increasing doses, anti-bodies are produced. These morphin anti-bodies, then, constitute the disease, which has been aptly designated by some authors as addiction disease, the only immediate antidote for which is opium or one of its derivatives. This is clearly proved by the fact that when the drug is suddenly discontinued in an habitué, there occur acute and characteristic symptoms. It is, perhaps, a Utopian prophecy to state that future research workers may discover some antidote for the anti-bodies."

Ministry of Health of Great Britain—Departmental Committee on Morphine and Heroin Addiction—1926.[53]

In September, 1924, the British Ministry of Health appointed a Committee[54] to consider certain matters relative to the prevalence of addiction, the Dangerous Drugs Acts and regulations in reference thereto, to suggest administrative measures that might seem expedient as a result of their investigation, and to consider the advisability of bringing preparations containing morphin and heroin of a percentage lower than that specified in the Dangerous Drugs Acts within the provisions of the acts and regulations. The Committee, for the purposes of its investigation and report, defined the word "addict" as "a person who not requiring the continued use of a drug for the relief of the symptoms of organic disease, has acquired as the result of repeated administration, an overpowering desire for its continuance and in whom withdrawal of the drug leads to definite symptoms of mental or physical distress or disorder."

---

[52] Somerville, Wm. G.—Who is Responsible for the Drug Addict? Chairman's Address, Section on Neurology and Psychiatry, Southern Medical Association, Washington, D. C., Nov. 12-15, 1923. Discussed by Drs. M. A. Bliss, M. L. Graves, E. Bates Block, Beverly R. Tucker, Tom A. Williams and D. Percy Hickling. Southern Medical Journal. Feb. 1924. p. 108-112.

[53] Ministry of Health. Departmental Committee on Morphine and Heroin Addiction. Report. His Majesty's Stationery Office. London, 1926.

[54] For the membership of this Committee see page 131 footnote.

The Committee further defined the nature and causation of addiction as follows:

> "The nature and causation of morphine and heroin addiction are so closely associated that they are most conveniently considered together. While there were differences of opinion among the medical witnesses whom we heard as to the importance of the parts which different causes may play in the production of addiction, there was general agreement that in most well-established cases the condition must be regarded as a manifestation of disease and not as a mere form of vicious indulgence. In other words, the drug is taken in such cases not for the purpose of obtaining positive pleasure, but in order to relieve a morbid and overpowering craving. The actual need for the drug in extreme cases is in fact so great that, if it be not administered, great physical distress, culminating in actual collapse and even death, may result, unless special precautions are taken such as can only be carried out under close medical supervision, and with careful nursing. It is true that there is a certain group of persons who take the drugs in the first instance for the sake of a new and pleasurable sensation, e.g., the 'underworld' class, who often use heroin for this purpose as a snuff. But even among these a morbid need for the drug is acquired and the use is maintained not so much from the original motive as because of the craving created by the use."

CHAPTER V

PATHOLOGY

SOMATIC AND PSYCHIC CHANGES

In reviewing the literature on the somatic and psychic changes that may take place in chronic opium intoxication, we find practically no general pathologic studies. On the contrary, it is apparent that the great majority of investigators have been stimulated by interest in only one or another aspect of this condition. This may be due in part to the fact that uncomplicated cases seldom come to autopsy for the reason that rarely, if one may judge from the certified causes, does death result from chronic opium intoxication. Further, in many cases of death of chronic users the obvious presence of an intercurrent, acute condition and ignorance on the part of the last medical attendant of the existence of the opium intoxication lead to the omission of any reference to the latter as either a direct or contributory cause of death.

Whatever the reasons, reports of pathologic findings in general have been scanty, disconnected, and incomplete, making it impracticable to attempt any anatomic or physiologic grouping of such findings. We have selected, therefore, for separate consideration in a later chapter that portion of the material dealing with pathology which especially refers to the mechanisms of tolerance, dependence, and withdrawal. The balance is presented in chronologic order, regardless of relationships, leaving the reader to evaluate and correlate it as he sees fit.

Writers who have treated the subject of chronic opium intoxication in a general manner very frequently have combined their handling of symptomatology and pathology so intimately as to make it impossible to separate them. In the writing of textbooks and special articles on the clinical handling of these cases, this is natural if not inevitable. The reader, therefore, is referred to the chapter on symptomatology for the views held by general writers on pathology which have not been included in this chapter.

Among the earlier writers very little, if any, definite pathology is described, and much of it is doubtless the result rather of speculation than of post-mortem findings.

Alonzo Calkins—1871.[1]

Calkins quotes Hill and Oxley to the effect that following the deprivation of the drug, "glandular degenerescence, rickets, a hydropic tendency or albuminuria will likely ensue."

H. H. Kane—1882.[2]

This author, in dealing with the effects of opium smoking, without any details as to morphologic tissue changes, describes at considerable length symptoms and functional disturbances, both somatic and psychic. He emphasizes intellectual degeneration and glandular alterations. He states that the urine contains mucous fibrillae, epithelial cells and an increase in the earthy and alkaline phosphates with a specific gravity of 1.004 to 1.015. In twenty examinations he states that he found no albumin or sugar, but that morphia in varying quantity was always present. Catarrh of the throat and nose, conjunctivitis with burning and excessive lachrymation were not uncommon. Amenorrhoea is common. The color of the habitual smoker is pallid, while herpes and other trophic changes are rare. The sweat is sometimes profuse, stains the body and bed linen a brownish color and has an odor of opium.

Daniel Jouet—1883.[3]

Jouet, while not discussing the mechanism of tolerance or offering any explanation therefor, mentions an interesting fact in this connection. He states that individuals who show an intolerance for morphin as indicated by nausea, vomiting, vertigo, weakness, etc., develop, if they persist in the daily use of the drug, marked cachexia, which is not like morphinism and which causes death very much more rapidly than does morphinism. Others, he states, for reasons more or less well known, succumb after the first few injections, and in still other morbid states, such as insanity, the phenomena of morphinism and especially those of withdrawal do not occur at all.

---

[1] Calkins, A.—Opium and the Opium Appetite. 1871.

[2] Kane, H. H.—Opium Smoking in America and China. 1882.

[3] Jouẹt, Daniel—Étude sur le morphinisme chronique. Thèse de Paris. 1883.

W. von Tschisch—1885.[3a]

This author administered morphin sulphate to eight dogs; to two of these he gave acute poisonous doses, the dogs living only a few hours. In the others he induced chronic poisoning which lasted from 28 to 62 days before the dogs were put to death. The total amount of drug in grains and the sizes of the doses administered to the dogs subjected to chonic intoxication, together with the autopsy findings, follow:

"Dog No. 3 received 135 grains (XXVII×5)
” ” 4 ” 150 ” (XIV × 5 + VIII × 10)
” ” 5 ” 170 ” (IV × 5 + XV × 10)
” ” 6 ” 200 ” (XX × 10)
” ” 7 ” 134 ” (II × 10 + XXI × 5 + III × 3)
” ” 8 ” 125 ” (XIV × 5 + XV ×3)

"The Roman numerals indicate the number of doses, the Arabic the size of each dose. As evident from the table, the doses were administered either daily or every other day, in rare cases only every third day.

"The autopsy disclosed hyperemia of the brain and the spinal cord only in the cases of acute poisoning.

"I begin now the description of the ganglionic cells, since the alterations in those showed themselves characteristic and constant to a higher degree. When the spinal cord of dogs No. 3, 4, 5, 6, 7, 8 was examined, whether in fresh or hardened state, the alterations in the cells were always sharply defined. Cells of normal appearance occurred either extremely seldom or not at all. These alterations were as follows.

"The protoplasm of the cells is swollen, turbid; the entire body has a more or less rounded form; the processes are either not visible at all, or their number has decreased; of the processes still present some appear attenuated and very short; such cells take the carmine stain rather intensively. The majority of the cells in No. 3, 4, 5 have the appearance just described.

"Another alteration of the cells, which occurs in all cases, though only in small quantity, is vacuolization: clear spaces, varying in size and almost round in shape, have formed themselves in the more or less altered protoplasm of the cells. The vacuoles have the appearance of cavities, or again, the protoplasm of the cells seems hollowed out, as it were. It is possible to follow up the transition stages from small vacuoles to such as occupy almost the entire body of the cell; there remains, therefore, of a cell affected in the latter way only a crescent-shaped rim. In one cell several vacuoles are observable, which give the cell the appearance of a structure hollowed out in a different fashion, or again, when the vacuoles pierced through the entire surface, the cell has a sieve-like appearance. The vacuoles take neither the carmine nor the osmic acid stain; when greatly magnified (Hartn. 3/10 ??), they looked like cavities traversed in all directions by very fine, whitish fibers intersecting each other. Vacuoles occur also in the substance of the processes; the processes themselves were generally wanting in cells which were extremely vacuolated. Cells with numerous and large vacuoles occurred but rarely; cells with one or two vacuoles occurred more frequently.

[3a] von Tschisch, W.—Ueber Veränderungen des Rückenmarkes bei Vergiftung mit Morphium, Atropin, Silbernitrat und Kaliumbromid. Virchow's Archiv. 1885. Vol. 100. pp. 147-176.

"A third type of alteration of the ganglionic cells is the fine-grained degeneration of their protoplasm with complete absence of processes. The nucleus is surrounded by a fine-grained mass, which takes the carmine well; this mass passes over into the surrounding tissue without definite boundaries, or else, it is inclosed by an empty space. Such cells are distinctly reduced in size—the entire amount of protoplasm is sometimes smaller than the nucleus; sometimes only the nucleus is to be seen, without a trace of protoplasm or perhaps surrounded by a few fine granules. Cells altered in this manner occur in considerable numbers in all cases.

"In all cases there are present in great numbers cells of rounded form with processes altogether missing; their protoplasm takes a very weak carmine stain, and consequently, in cross-sections stained with carmine, these cells are sharply distinguished by their coloring from the surrounding tissue. Such cells appear almost homogeneous, and only occasionally do they appear granular at the edges. It is absolutely impossible to isolate them, since their protoplasm falls to pieces at the slightest maltreatment. Vacuoles are not visible in these cells.

"Finally, in cross-sections from the spinal cord of dogs No. 7 and 8, it is possible to see various transitions from such pale cells to completely hollow spaces of rounded form lying in the tissue. Sometimes the pale protoplasm in a cell appears partly homogeneous, partly fine-grained, and the entire cell does not take up all the space left in the tissue; sometimes, in another cell, the entire protoplasm appears granular, but part of it is paler than the rest; sometimes there is present in place of the cell a scant number of small pale granules and extremely fine, short, pale fibers; or again, only the latter are represented; finally, one may see completely empty discs in the tissue. From the observation of these transition-forms, therefore, we can only draw the conclusion that we have before us in a given case remnants of nerve-cells; also, only in this way is it possible to understand in what manner these cells perish completely.

"Only the cells just described are without nucleus; in all the rest the nucleus is always preserved.

"The cells in all the spinal cords, therefore, are variously affected: in the spinal cords of dogs which have perished of chronic poisoning rarefaction of the cells is most pronounced; in the spinal cords of those which died of less chronic poisoning the turbid swelling of the cells is most prominent. All other alterations are common to all cases.

"The nucleus is preserved in all cells except those which appear rarefied; nevertheless, only in a small number of cells—and this in the case of dogs No. 3 and 4—does it show no sharp pathological alterations. In the majority of cells the alterations are characteristic and peculiar.

"As already mentioned, the nucleus—with the exception of an extremely small number of cells—always stands out very distinctly in the midst of the entire protoplasm; it always appears as a perfectly round, gleaming, colorless, double-rimmed disc, filled, without exception, with large granules of irregular shape, which take the carmine stain well. These granules are almost always of the same size, and only seldom is it possible to discover near them a few very tiny granules. As a result, the nucleus is always especially distinct in lightly stained cells. In a small number there may be seen nuclei whose bright, gleaming disc contains very few, small granules, which take the stain weakly. Such nuclei occur as much in well-preserved cells, which take the stain well—in which, therefore, the nucleus appears much paler than the protoplasm—as in the cells whose protoplasm has suffered most alteration through one of the above-described processes. The granules which fill the disc are usually uniformly distributed; however, there also occur cells in which the granules lie along one edge of the disc only, whereas the other edge is entirely free or else contains but very few tiny granules. The nuclear corpuscle can be discerned only in the best preserved nuclei. The altered nucleus is sometimes surrounded by a comparatively brighter ring of protoplasm. Nuclei altered in this fashion are present in all the spinal cords—the longer the duration of the poisoning the greater their number, it seems. In the spinal cords of dogs No. 7 and 8 many cells have no nucleus at all, or else the latter is represented by a small number of pale, small granules.

"After acute poisoning (cases 1 and 2) the alterations in the cells are by far not so characteristic. Neither in isolated cells of the fresh spinal cord nor in cross-sections of the hardened one is a fibrillar, granular structure to be seen in the protoplasm; the protoplasmic processes are preserved for a short stretch only and in but few cells. The protoplasm of many cells is swollen and turbid; the body has a more or less spherical form. Beside cells altered in this fashion there are seen others which take the carmine stain intensively, have a small circumference, and are, as it were, hollowed out at the edges by small vacuoles.

"As regards the vascular system, the following alterations appear in No. 3, 4, 5, 6, 7 and 8. First of all, the phenomena of a more or less considerable hyperemia strike the eye. In the vessel-walls there are seen a multiplication and swelling of the nuclei, especially noticeable in the capillaries, where these nuclei project into the lumen of the vessel and cause it to disappear almost entirely. In a small number of specimens there are seen in the vessel-walls small, birefringement granules of fatty nature and rounded form. In the subadventitial spaces there is always visible an enormous number of white and red blood corpuscles.

"In cross-sections of the hardened spinal cord there occur considerable accumulations of red blood corpuscles near the vessels and also independently of them—without exception in the gray substance. Hemorrhages were particularly numerous in spinal cord No. 5.

"In addition, there are seen in the gray substance, especially in proximity to the vessels of spinal cords No. 5, 6, 7, 8, small, homogeneous, structureless masses of a plasmatic exudate, which not only destroy the connection between the elements of the subjacent tissue and even impair their integrity—the fragments of nerve-cells and nerve-fibers found in and near these masses are evidence of this—but also infiltrate the tissue to a considerable extent. Not a single time did I see large masses of the plasmatic exudate; sometimes, however, numerous accumulations of the exudate were visible in one and the same cross-section. In specimens of the fresh spinal cord, granular and fatty-granular cells occurred in proximity to the vessels in all cases, and in especial abundance in the spinal cords No. 7, 8.

"In the gray substance of all the spinal cords, and particularly of No 5, 6, 7 and 8, the complete absence of nerve-fiber processes was striking. Everywhere there were products of a fine-grained detritus, which accumulated more especially where the nerve-reticulum was altogether destroyed, so that in places the entire field of vision was occupied by the detritus; everywhere the nerve-reticulum has lost the distinctness of its outlines. Only a small number of its fibers took the carmine stain, and even this only for a short distance.

"In general it may be said that specimens with cells that had suffered most alteration showed most distinctly pronounced alterations in the vessels and in the nerve-reticulum, although at times—in No. 5, for example, where the number and extent of the hemorrhages appeared the greatest—the cells, in comparison with other numbers, were not so considerably altered. A more complete and more constant relation is observable between the alterations of the nerve-cells and those of the nerve-reticulum."

B. Ball—1887.[4]

Ball gives the following account of an autopsy of a patient who died thirteen days after withdrawal of the drug.

On autopsy most of the organs appeared normal. There were no valvular lesions of the heart and no dilatation of the ventricles. The myocardium was pale and showed histologically a beginning fatty degeneration of its fibres but this was only slight. The orifice of the aorta was small (0.019 cm.); otherwise the aorta was normal. Microscopic examination of the central nervous system showed no alteration of the nervous elements. There was a slight congestion of the bulb and of the pia mater. There was a pronounced oedema of the brain.

---

[4] Ball, B.—Des lésions de la morphinomanie, et de la présence de la morphine dans les viscères. Encephale. 1887.

The kidneys and liver were normal in appearance but some of the liver cells showed beginning fatty degeneration. Thus the fatty degeneration of the heart mentioned above was the only important lesion and this was not enough to have caused death.

The chemical examination showed a more interesting fact. Undoubted traces of morphin were found in the brain, spleen, and kidneys, but especially in the liver the drug appeared to be stored up. From washing this organ with water and alcohol, a solution was obtained which gave very positively all the tests for morphin. Apparently, a considerable amount was stored up in the body.

Washings of macerated liver showed the presence of morphin by the following tests, Bouchardat's—iodide of potassium, Marmé's—double iodide of cadmium and potassium, Hessler's—double iodide of mercury and potassium, Frohde's sodium molybdate and sulphuric acid and also the perchloride of iron test.

Thus, the author states, after thirteen days of abstinence, there was still morphin stored up in the body. It would appear, therefore, that this poison may remain a long time in the viscera and that its presence in the organs may explain by a sort of auto-intoxication the late symptoms which are sometimes observed in morphinists, long after the withdrawal of the drug. Cases, he states, have been known to die in collapse several days after apparent cure.[5]

Pilliet—1887.[6]

Pilliet, referring to pathologic studies on dogs, states that two adult dogs were injected daily with morphin for three weeks, increasing 1 centigram every two days, until at the end of this time they were getting 10 cgms. daily. By this time the animals had lost their appetite and were in a state of habitude. Abscesses developed and they were killed before suppuration could cause complicating lesions.

---

[5] We are led to speculate here as to whether such storage of the drug may not explain the recurrence of certain symptoms which are produced both by the abuse of morphin and abstinence. If these findings are correct and morphin is still stored in the liver for days or weeks after withdrawal, one may question the completeness of so-called "cures" that release their patients after a few days' treatment. Herein may possibly rest the explanation of some of the early relapses following certain routine institutional treatments. The relationship of such possible storage of morphin to the mode of treatment pursued, the length of intoxication, the activity of elimination, the general status of the patient, and to what Sollier calls the "eliminatory crises" are all problems in need of solution, which quite conceivably may have an important bearing on treatment, prognosis, and the prevention of relapse.

[6] Pilliet—Note sur les Lésions histologiques de l'Intoxication morphinique subaigue. Comp. rend. Soc. de Biol. 1887. 8s. IV. p. 566-588.

Aside from skin and subcutaneous changes near the seat of the injections, the liver showed fatty degeneration, the cut surfaces being opaque and glistening. The course of the change was traced. It began as an intracellular steatosis which was present and equal over all the lobules. There the fat collected in droplets in the cells near the subhepatic vein. In other parts there were small areas around the portal veins where the cells were not distended with fat. There was no trace of embryonic infiltration or of proliferation of the connective tissue.

The author reports finding fatty degeneration of the liver, less marked than in these dogs, in two morphinists, one a case of tabes and the other a case of cancer of the uterus. The brain examined in different places showed many granular bodies between the white and gray substance, bodies which were also collected in masses in the corona radiata. In the gray matter the external neuroglia and the small cells seemed normal but the layer of large cells showed a considerable decrease of these elements as compared with normal dogs, in which they are very numerous. There was no connective tissue proliferation. The muscles and other tissues appeared normal. The author states that other alkaloids and certain mineral poisons cause a similar steatosis of the brain and liver, so that the changes observed are not specific.

Saratschow—1895.[6a]

Tschisch reports the work of Saratschow relative to histologic changes in the central nervous system in acute and chronic morphin poisoning. In what follows the abstract is given in full:

"The author, on the invitation of the writer, set himself the task of checking and elaborating the investigations of the latter regarding the alterations in the central nervous system in connection with morphin poisoning (Ueber Veränderungen des Rückenmarks bei Vergiftung mit Morphium, Atropin, Silbernitrat und Kaliumbromid. Virchows Archiv. Bd. C. Referat im Neurol. Centralbl. 1885), employing for this purpose the latest methods of fixation and staining; in addition, the author studied the condition of the central nervous system after a fairly long period of continued poisoning with morphin. Saratschow discovered indubitable alterations in the central nervous system in connection with both acute and chronic poisoning (longest test—156 days). In the case of acute poisoning the vascular alterations were more distinctly marked than in chronic poisoning. These were: dilatation and hyperemia of the vessels, thickening and homogeneous clouding of the capillary walls, increase in size of the endothelial nuclei; coagulated exudation with form elements in the sub-adventitial spaces of the larger vessels. In chronic poisoning the author found alterations of a degenerative character; the greatest alteration occurred in the ganglia of the anterior cornu of the spinal cord. The author, having made a careful study with regard to the significance of the vacuolization in the ganglion cells, came to the conclusion that the vacuolization of the nerve cells is not to be regarded as a similar symptom from the point of view of its origin and its significance; that it is undoubtedly a pathological symptom. No pathological alterations were found in dogs who were put to death a month after the discontinuance of the administration of morphin; since in every other respect the animals had been subject to the self-same conditions, and since the method of fixation and staining was likewise the same, the absence of alterations ascertained by the author serves as further confirmation of the fact that it really is the morphin that causes the alterations in the central nervous system attributed to it. Although the alterations found by the author greatly resemble in general those observed in connection with poisoning through other poisons, as e.g., with lead and quicksilver poisoning (N. M. Popoff) etc., nevertheless, the picture of the alterations due to morphin poisoning is so characteristic, that Saratschow draws the conclusion therefrom that 'the presence of characteristic and specific alterations due to morphin poisoning may not yet be denied.' "

[6a] Saratschow—Ueber die Veränderungen in den Nervenelementen des Centralnervensystems bei der Morphiumvergiftung. Abstract from Neurol. Centralbl. 1895. Vol. 14. pp. 366-367.

American Textbook of Applied Therapeutics—1896.[7]

"The symptoms produced by an habitual indulgence in opium in any of its forms—no matter how introduced into the system—may conveniently be divided into two great classes, namely, those produced on the body and the effects on the mind of the victim. Of these, the mental deterioration is the most serious by far. The effects on special organs or on the constitution as a whole, even after the victim has been accustomed for years, it may be, to enormous doses of the drug, scarcely ever assume so grave a form that he may not be cured of the evils in a comparatively short time. The chief difficulty of the whole treatment of opium-eating or morphin-injection, or any of the rarer forms of indulgence in the narcotic, lies in the great resistance that the patient's mental perversity offers to any attempt at cure. It is the craving for the unnatural stimulant that must be fought; if this craving is overcome, all the rest is comparatively easy."

* * * * *

---

[7] Wilson, J. C. and A. A. Eshner—American Textbook of Applied Therapeutics. 1896.

"In the earlier stages mental brilliancy, lasting as long as the stimulating effect of the drug persists, is sometimes noted. Some of the best speeches and a few excellent literary productions are said to have owed their inspiration to opium. However, that may be, the physician rarely sees the victim in that stage. When the morphinist consults him, not generally of his own volition, but induced to do so by the vigorous persuasion of his friends, whom he cannot easily refuse, as his habit generally makes him dependent on them, he is in most instances a physical wreck; often his finances are in the same condition, and his morality is weak. This latter statement refers, however, chiefly to his morality in respect to the habit. About opium and morphin these people always lie. When they cannot obtain the drug by fair means, the other kinds are resorted to without scruples. Stealing the drug or the money for it, forgery of prescriptions, and bribery of attendants are some of the means resorted to; otherwise the victims may be of excellent moral character. It is seen, therefore, that the craving or appetite for the poison is the cardinal point in the whole horrible habit, and, as already mentioned, the physician will have to devote his energies chiefly against this craving, and in trying to overcome it he will find the greatest difficulty."

Franz Nissl—1897–98 [7a]

In a preceding article published in the same year, the author calls attention to a distinction which he makes between *chronic* poisoning and *subacute maximal* poisoning. He says that in inducing experimental poisoning time is not the only factor, the amount of the dose being another, and that it is his opinion that most of the experiments performed to date are more fitly designated as subacute maximal poisonings than as chronic poisonings. He continues:

". . . In this kind of poisoning the process extends from a few days to months, according to the poison selected. As long as possible, the animal receives daily the maximal quantity of poison which, it has been decided, will just not jeopardize any longer the life of the animal through the individual dose. The experiment ends with the death of the animal. The amount of the maximal dose for each poison is easily ascertainable by means of experiments suited to the purpose. In my experience, if the maximal dose has been chosen correctly, death occurs in the individual animals, treated with the same poison, at about the same time. Subacute maximal poisoning yields the clearest, most distinct results; it is, therefore, the most suitable method for investigating the action of the poison. The experiment in subacute maximal poisoning is, therefore, primarily a *preparatory experiment*. If by means of subacute maximal poisoning exact information has been obtained as to the mode of operation of a poison, the amount of the dose which will not immediately endanger life, as well as the limits of the habituation to the poison, which generally develops, and if the preparatory experiment has shown which kinds of cells resist the poison most and least, then the real experiments in poisoning can be made, i.e., experiments in *acute* and *chronic* poisoning; in both of these, again, various degrees may be produced. The form of *chronic* poisoning which is of special importance to us is the one in which a dose which of itself will not produce any violent symptoms is administered for as long a time as possible."

[7a] Nissl, F.—Die Hypothese der specifischen Nervenzellenfunction. Allg. Ztschr. f. Psychiatrie. 1897-1898. Vol. 54. pp. 1-29. Also Beiträge zur Anatomie und Histopathologie der Nervenzellen mit besonderer Berücksichtigung der pathologischen Zellveränderungen nach experimentell erzeugten Vergiftungen. All. Ztschr. f. Psychiat., 1897-1898. Vol. 54. pp. 29-107.

In an article dealing with the anatomy and histology of the nerve cell, and the pathologic changes which it undergoes in experimentally induced poisoning, the author states:

"It should never be forgotten that acute maximal poisoning is an extremely brutal form of invasion, and that this kind of poisoning is primarily a preparatory experiment, as I have explained elsewhere. For this reason it is entirely superfluous to fear that the conditions of cell-degeneration which I have described and pictured may perhaps appear only in quite isolated and sporadic cases. That such is not the case is seen at once from the investigation of those gray foci (*Herde*) in which cells of similar structure are close to each other. To be sure, as regards those classes of cells which inhabit the gray masses without being closely packed, or which are found singly amidst other cells, as is the case with the motor cells, the situation is somewhat different; it would then be just a matter of a poison which, like the tetanus toxin, for example, acts directly on the cells of the motor class.

* * * * *

". . . The cells altered by morphin show essentially different conditions from those shown by the elements—just described—which had undergone alcohol poisoning. First to be emphasized here is the fact that the unstained substance of the cells is distinctly altered. It has become only slightly stainable. We, therefore, observe in the tissue long dendrites—mostly apical processes—consisting entirely of unstained substance. But the stained substance, on the other hand, is also altered. It is decidedly rarefied a little; in particular, the intensively stained parts are much less strongly colored. In general, the stainable substance is, as a whole, more weakly tinged, and the individual portions of the substance have become smaller. It is difficult to come to a very definite decision with regard to these points, as on account of the alteration of the uncolored substance the colored parts no longer stand in clear relief against the uncolored. The nuclei, too, become smaller and appear to be more darkly colored. At the same time, they frequently lose their roundness and become slightly oblong. Altogether the poisoned cells are decidedly smaller, narrower, the basal parts more angular, and the dendrites proceeding from here show more distinctly."

J. Ewing—1898.[7b]

The author reports the autopsy findings in cases of chronic morphin poisoning with superimposed acute poisoning, in the following:

"*Morphine Poisoning.*—The present series includes three cases of poisoning by morphine.

"Case I.—Male, 45 years. Had been addicted to the use of the drug for several years, finally using 16 grains of morphine hypodermically injected, each day, and had suffered in an extreme degree from the general symptoms referable to this habit. Was said to have eaten nothing for one week before death. After a very large injection, quantity unknown, was brought to hospital in coma, dying within a few hours with typical symptoms of morphine poisoning.

"Autopsy six hours after death. There was moderate fatty degeneration of heart-muscle, liver, and kidney. The lungs were very œdematous, and the viscera showed marked venous congestion. The pancreas was very atrophic, being largely replaced by fat. There was considerable œdema of the brain.

"Fixation, Lang's fluid, 24 hours.

"The chief feature of the changes revealed by Nissl's stain was a marked diminution in the quantity of chromatic substance in nearly all cells of the central nervous system. The chromatic bodies in the cells of the *cord, medulla, cerebrum,* and *cerebellum,* were very deficient in size and number or often entirely absent. *Purkinje's cells* were very faint, showing a few small, narrow chromatic bodies, very regularly arranged in concentric rings. Nuclear changes, as a rule, were not noted.

"In the *medullary nuclei,* there were some cells still retaining chromatic bodies of considerable size but markedly subdivided. In some of these cells the nuclei were shrunken and often eccentric.

"The quantity of yellowish granular pigment was much more abundant than usual in most regions of the central nervous system.

"Case II.—Female, age 24 years. Had been addicted to the moderate use of the drug for a few months only, but was able to attend regularly to her work as dressmaker. In a fit of despondency she took a large quantity of morphine by mouth, and in spite of treatment, died twelve hours later, with typical symptoms of morphine poisoning.

"Autopsy six hours after death.

"There was extreme œdema of the lungs, and marked venous congestion of all viscera, but no other gross lesions of importance.

"Microscopical examination. Van Gehuchten's fluid.

"The *stichochrome cells* throughout the central nervous system showed changes which in many respects were peculiar. When examined with a low power, these cells appeared to have lost their normal distinctly striated appearance, many appearing diffusely and unevenly stained while their outlines were extremely irregular. When examined with a high power, the above peculiarities were found to consist in a marked subdivision of the chromatic bodies which were enlarged and very irregularly and minutely subdivided.

[7b] Ewing, J.—Studies on ganglion cells. Arch. of Neurology and Psychopath. 1898. Vol. I. No. 3. pp. 263-440.

"In the *medulla* the large cells were extensively altered, further, by the appearance of *clefts* in the cell bodies, similar to those described in other conditions by Nageotti and Etlinger. In this region also the loss of chromatic substance was very uneven, some areas of the cells appearing completely bleached, others showing the minute subdivision, while in some spots the chromatic masses seemed fused together.

"The majority of the cell nuclei were shrunken and markedly eccentric, while the loss of chromatic substance was as a rule greatest about the nucleus. About many of the nuclei irregular masses and rods of chromatic substance were heaped. . . .

"*Throughout the cortex* changes of a similar character were noted. *Purkinje's cells* of the cerebellum were less affected than the cells of most other regions.

"The irregularity in the effects of the chromatolytic process, the ragged appearance of the cell borders, the appearance of clefts, and the frequency of central chromatolysis associated with eccentricity of nuclei, are the features peculiar to this case. The last mentioned abnormality is of special interest in connection with the well-known effect of morphine upon the peripheral nerve filaments.

"Case III was identical in all important respects with Case II."

G. Jacottet—1898.[7e]

Jacottet in a study of the changes in the brain cells, spinal ganglia and in certain experimental poisonings gives the following in connection with morphin poisoning:

"We find in the literature two publications on the medullary lesions caused by experimental morphinism. The author of one of these suggested by the Russian physician, Mierzejewsky, is v. Tschisch. The other is by Sarbó. The second work is the only one which we considered in our experimental study.

"We gave the morphin to our animals hypodermically in an aqueous solution of the hydrochloride.

"Observation V.

"A rabbit 2½ months old, weighing 680 gs., received on April 7, 1896, 1 cu.cc. of a 1:500 solution of the drug. This dose was increased daily until the 29th of the same month when it was 6 cm.^{3} From this date until May 6 a 1:200 solution was used up to an average of five or six cm^3 daily. Then, from the 7th until the 22nd of May, the solution was increased in strength to 1:100; the amount of the solution injected each time varied from four to six Pravaz syringefuls. Finally from May 23 until death occurred, we made use of solutions of 3:100, given in the same amounts as the preceding.

[7e] Jacottet, G.—Étude sur les altérations des cellules nerveuses de la moelle et des ganglions spinaux dans quelques intoxications expérimentales. Ziegler's Beitr. 1898. Vol. 22, Part 3.

"On the 19th of June the animal was chloroformed.
"Its weight was 1220 gs.
"Total length of treatment 73 days.
"Total amount of pure morphin hydrochloride 2.53 gs.
"Total gain in weight 540 gs.

"Observation VI.

"A rabbit, 5 months old, weighing 2,000 gs., received from April 11 to the 19th of June, 1896, exactly the same daily amount of morphin as No. V, but the intoxication was continued under the same conditions until August 7.

"On August 8 the animal was extremely thin and was chloroformed.
"Its weight was only 1,570 gs.
"Total length of treatment 118 days.
"Total amount of pure morphin hydrochloride 7.31 gs.
"Total loss of weight 430 gs.

"In these two animals at autopsy the brain and medulla did not show even meningina hyperemia observed by v. Tschisch; macroscopically everything was normal.

"Microscopic Examination.

"Only the methods of Nissl, Sadowsky and Ramon y Cajal, make it possible to determine certain unusual conditions in the large cells of the anterior pons and of the lateral portions of the gray medullary substance. The remainder of the spinal axis was not changed. Here again we have to deal with a granular degeneration of the chromatin. This change in the protoplasm was very wide spread; it affected almost all of the motor elements of the brain. Here and there were found intact cells. In some instances the perinuclear chromatin bodies were most affected; in others those lying in the edges or prolongation of the cell.

"The partial degeneration of the chromatin, as seen in alcoholism and as Sarbó describes it, was usual.

"The nucleus was never altered. The granulation of the nucleus was sometimes affected to a remarkable degree, but it was not broken. We did not observe 'homogeneous tumefaction' spoken of by our predecessor, although our rabbits had received much more morphin than had his. He had only given to one of his 0.09 gs. of poison in 42 days, and to the other he gave only 0.11 gs. in 71 days.

"Our studies on this state of chromatin of the intervertebral ganglia led us to the conclusion that they had undergone no appreciable change."

Ottone Barbacci—1899.[7d]

In an article dealing with the nerve cells in their anatomic, physiologic and pathologic relations, the author reviews the findings of several investigators in acute and chronic morphin poisoning in what follows:

[7d] Barbacci, Ottone.—Die Nervenzelle in ihren anatomischen, physiologischen und pathologischen Beziehungen nach den neuesten Untersuchungen. Centralbl. f. allg. Path. u. Path. Anat., 1899. Vol. 10. pp. 757-823; 865-936.

"In connection with morphin poisoning Nissl found in the cells of the cerebral cortex a slight coloring also of the interstitial substance, so that here, too, the dendrites were visible for an unusually long stretch. The stainable matter is somewhat rarefied and all of it is more lightly colored. The individual stainable cells are also smaller than normal. The nuclei are smaller, more oblong, and appear darker than usual. The cells themselves are altogether smaller, narrower, their basal parts more angular, and the dendrites starting from here appear more prominent in consequence.

"The alterations found by Sarbó were not very different.

"Saratchoff subjected dogs to acute and chronic poisoning. The alterations are predominantly in the anterior cornua of the spinal cord. They appear in slighter degree in the cells of the bulbus and the cerebral cortex. In acute poisoning the lesions show themselves principally as swelling of the cells, loss of the processes, and formation of vacuoles. In chronic poisoning granular degeneration of the protoplasm is predominant. The chromatic substance disappears more or less entirely; the protoplasm takes on a gelatinous appearance; the nucleus does not take the stain well; the contour of the cell becomes indistinct.

"In a dog which died of morphin poisoning amidst violent symptoms of excitement in the motor area, Caterina found the cells of the cerebral cortex, whatever their type, more or less seriously altered. Where the alteration had made most progress, there can be seen dispersed, trabecular remnants of the very pale protoplasm, throwing into relief the more heavily, though diffusely, stained nucleus. Forms of homogenization with atrophy of the nucleus and irregularity in the contour of the nuclear membrane also appear.

"Mankowsky (Russ. Archiv. f. Pathol. etc., Vol. 6, 1898) experimented with guinea-pigs, rabbits, white mice, and dogs. In each species one animal was subjected to acute poisoning, one to chronic, and a third was put to death while quite healthy; the same brain-parts were extracted from the latter for microscopic examination as from the animals experimented upon, i.e., the anterior cornua of the spinal cord, the ganglion cells of the medulla oblongata, the pyramidal cells of the cerebrum, and the Purkinje's cells of the cerebellum. In connection with acute poisoning, varying degrees of chromatolysis were observed; in the cell body these consisted of the atrophy of the Nissl bodies in the periphery of the cell and the alteration of their form and size in the center of the same, close to the nucleus. In the protoplasmic processes the chromatic cells are disintegrated. The entire cell becomes sinuate. The nucleus and the nuclear cell remain unaltered. In connection with chronic poisoning the chromatolysis in both the cell body and the processes attains the highest degree—atrophy of all differentiation whatever in the chromatophile substance. The latter becomes a powdery, irregularly dispersed mass. In the cell body as well as in its processes, there are formed in consequence vacuolar foci (*Herde*) free of chromatin. The processes, moreover, are heavily thickened. The contours of the nuclei become irregular, clot-like. The cell gives the impression of being in the process of decay; the cells of the cerebrum are most seriously affected.

"Traina induced acute, subacute, and chronic poisoning in dogs, rabbits, and guinea-pigs, and examined the various sections of the cerebro-spinal axis by means of various methods. In the acute cases he found minimal lesions. The elements retain their spinous investment, and only seldom does one see a few rosary-like swellings. A few elements show indications of incipient peripheral chromatolysis. In subacute poisoning there are pronounced diffuse alterations of the protoplasmic processes in the cerebrum and the spinal cord, consisting in a varicose condition which always begins at the finest ramifications. The axis cylinder is normal. Very few alterations in the cerebellum. Varicose condition of a few peripheral processes of the cells of Purkinje. Nissl's method reveals very slight alterations; a few cases of peripheral chromatolysis in the cells of the spinal cord, and powdery decay up to complete disappearance of the chromatin in the cells of the ganglia of the sympathetic. In chronic poisoning all these symtoms are intensified. In addition, there appears another alteration, not yet described—the presence of vacuoles in the protoplasmic processes; the author considers them a condition of œdema which attacks the process in a cellulipetal direction. Furthermore, there is incipient alteration of the neural process, which shows small nodules and swellings near the cell body. The elements showing most alteration are those in the cerebral cortex. All this was observed by means of Golgi's method; Nissl's method reveals peripheral chromatolysis in the spinal cord, which may go as far as the complete disappearance of the chromatic substance. Central chromatolysis or displacement of the nucleus is never seen; the intervertebral ganglia or those of the cerebellum show only slight alteration, but those of the sympathetic system show considerable—always by way of peripheral chromatolysis. The author draws the following conclusions from his investigations: Very important lesions are found in connection with morphin poisoning, and these increase with the duration of the action of the poison. These alterations begin at the finest ramifications of the dendrites and proceed towards the cell body and finally into the protoplasm. The absorption of the prickly processes usually precedes the appearance of varicose swellings. Normal cells can always be found between those which have suffered severe alteration. According to the author and contrary to the statements of the majority of other observers, the alterations perceptible by means of Golgi's method are more serious than those brought to view through other methods of staining the neural cytoplasm. The cells most altered are—in decreasing series—those of the cerebral cortex, those of the spinal cord, those of the ganglia of the sympathetic system, those of the cerebellum, and—least of all—the intervertebral ganglia.

"In two cases of chronic poisoning Jacottet found the intervertebral ganglia intact, while in the cells of the spinal cord he observed chromatolysis, which was at times perinuclear and again peripheral."

S. C. Fuller—1899.[8]

The author noted that in making red cell counts, using Gower's solution as a diluting fluid, there were found on microscopic examination in specimens from morphin users crystals closely resembling the smaller crystals of morphin sulphate. They were colorless, some needle-like, others tapering to a point and others forming narrow parallelograms. These crystals ranged in size from about 30 to 60 micro-millimeters in length and from 3 to 6 in width. The crystals were more abundant in cases using about 25 grs. of morphin daily and usually absent when less than 3 grs. was taken. Where crude opium or laudanum was being used the crystals were few or absent. Marked anemia was present in these cases. Experiments with morphinized rabbits, carried on by Prof. Rockwell of Boston University School of Medicine, showed the same phenomenon in three of five pairs of rabbits used. In two pairs of animals to which not more than 1½ grs. of morphin were given daily the crystals were not demonstrated.

The author thinks that this phenomenon may prove valuable as a means of determining when the patient is off the drug.

L. E. R. Lancelin—1902.[9]

Lancelin in a study of the rôle of the leukocytes in infections during morphinism,[10] states that in intoxications the body is weakened in all of its means of defence. Its various organs functionate less actively and less efficaciously, the large glands being altered in their elements. The liver cells degenerate and the organ becomes sclerotic; its functioning suffers and it becomes unequal to the task of neutralizing the noxious principles and the bacterial secretions. The kidneys are unable to throw off the daily waste, the glomerular filter is unequal to its task, its cells are so affected that poisonous products are reabsorbed and autointoxication is often added to the original intoxication.

---

[8] Fuller, S. C.—A Phenomenon Observed in the Blood of Morphinomaniacs. New Eng. Med. Gaz. 1899. Vol. XXXIV. No. 6. p. 241-250.

[9] Lancelin, L. E. R.—Morphinisme et Infections. Rôle des Leucocytes. Thèse de Bordeaux. 1902.

[10] In 1898 Cantacuzène in attempting to demonstrate that cholera vibrios were destroyed by the white cells rather than by the serum, narcotized laboratory animals with tincture of opium in order to eliminate the action of the white cells. In these experiments, he showed that the narcotic had a distinctly paralyzing effect upon the white cells, which lasted about 5 hours.

In general, the secretory epithelium undergoes marked alterations which naturally affects the bactericidal qualities of their secretions.

It is principally, however, in lessening phagocytosis that toxic substances render the organism abnormally receptive. The leukocytes, even admitting that they are sufficient in number, do not possess the necessary phagocytic activity and the conflict is most unequal.

The virus is not directly affected, but is assisted indirectly by the modification undergone by the body. Altering as they do the defences of the body, toxic substances hinder or prevent the destruction of the pathogenic organisms, which thus become more numerous than they would in a normal individual.

All of this, he states, applies in every way to morphinism. Morphin, in whatever form introduced, rapidly depresses the organism because of the enormous quantity which accustomed individuals take. Daily experience amply demonstrates this, when we see how easily the least wound suppurates and how frequently abscesses of all sorts develop. The vitality of their tissues is reduced to a minimum and healing takes place slowly.

Lancelin then undertakes experiments using eighteen rabbits and guinea-pigs and dividing the experiments into two series. In the first he studies the reaction of morphinized animals in the presence of virulent organisms; in the second he uses organisms whose virulence has been attenuated by heat or ageing. In each of these experiments he uses three animals, one chronically intoxicated for at least a month, one intoxicated for eight days, and one control. In each instance he makes blood examinations and leukocyte percentage determinations and a brief microscopic examination of the lesions occurring in the different organs.

In review the author states that the morphinized animals show less resistance than the healthy animals and that if they recover the recovery is delayed. Especially was the depressive effect of the morphin shown when attentuated cultures were used. He states that it is not due to an increased virulence of the organism, as Bouchard has shown that protoplasmic poisons affect the development of the pathogenic organisms as well as the defence cells of the body. It is, he claims, in the body itself that the cause of the lessened resistance must be sought. He states:

> "In the case of morphinism, the resistance of the body appears to be active, at least in so far as the leukocyte reaction is concerned. This reaction is intense

and reaches in virulent infections as many as twenty or twenty-one thousand white cells to the cmm. In attenuated infections where the body's defense takes a longer time to become established, this reaction goes as high as twenty-six or twenty-seven thousand. These facts prove a normal functioning of the leukopoietic centers, which are probably not affected by the morphin."

After a series of experiments of considerable speculative interest but which perhaps were not carried out in a convincing number of animals he concludes:

1. "Infections act more quickly on a morphinized soil."
2. "The more rapid death of the animal is not due to an arrest of the leukocytic function."
3. "It is not in the quantity but in the quality of the leukocyte that the cause must be sought."
4. "Death is due to an arrest of phagocytosis resulting from the inhibition of the leukocytes by the morphin. The chemical proof of this is given in our last experiments."[11]

R. Krafft-Ebing—1904.[12]

"Morphine never injures so profoundly the psychic organ as does alcohol, but I have never seen a morphinist that was psychically intact. Intelligence, it is true, is practically spared, but the highest mental functions—character, ethic feeling, self-control, mental energy, and force—always suffer. The fully developed morphinist is an individual weak in character and will and without energy, who should receive, under criminal prosecution, the benefit of attenuating circumstances, and who in the care of his interests and duties should always be given help.

"In severe cases we find, in addition, weakness of memory, especially defect in the power of exact reproduction, difficulty of intellectual activity that may reach the degree of torpor, occasionally psychic depression reaching even marked dysthymia and *taedium vitae,* great emotionality, and, in general, profound deficiency of resistive power to affects; and besides, there may be episodically nervous restlessness, excitement, even attacks of fear due to vasomotor causes, and occasionally visual hallucinations."

* * * * *

---

[11] In Lancelin's experiments it is assumed that an animal which has been given morphin for one month is typical in his reactions to an average case of chronic morphin using, but this would appear to be open to question. The author does not state the degree of tolerance attained by the animals he uses, but one would scarcely expect a high degree of tolerance to be established in four weeks, certainly not such as is witnessed in human beings after years of administration. It is quite conceivable, therefore, that his "chronically intoxicated" animals were not typical in their reactions and that in their apparent lack of resistance to infections they did not represent fairly the chronic user in whom years of administration have induced possibly a different "balance" to the drug.

[12] Krafft-Ebing, R.—Textbook on Insanity. 1904.

"Symptoms due to sudden total abstinence occur after about six hours. The patients become relaxed, weak, incapable of standing, have symptoms like those of cholera nostras, profuse sweating, general tremor, painful anxiety, restlessness going on to weeping, raving, and violent demand for morphine, which immediately removes all troubles due to abstinence, and the patient may not hesitate to commit a crime to get the drug.

"Not infrequently, following these symptoms of abstinence, there is an hallucinatory delirium lasting several days—a true delirium of inanition, which, on account of its numerous analogies with alcoholic delirium tremens, may well be called the delirium tremens of morphinism (numerous visions of animals; episodically also obscene deliria, mainly of frightful content, agrypnia, tremor). In severe cases the symptoms of abstinence and inanition may reach a point of dangerous cardiac and respiratory weakness, collapse, and coma, and make it absolutely a vital indication to administer morphine.

"Symptoms of intoxication and abstinence in the form of elementary psychic disturbances, anorexia, and asthenia, may exist a long time, even months, after the drug has been withdrawn."

R. Luzzato—1905.[13]

In connection with a study of glycosuria produced by morphin, this author endeavored to find out the relationship of chronic morphin intoxication to this condition. His results, he states, were in accord with Faust's findings that all symptoms of morphin poisoning disappeared or became very much less acute with the chronic use of the drug. He concludes as follows:

"Glycosuria disappears with gradually developing addiction to morphin."

Stewart Paton—1905.[14]

"The mental symptoms of morphinism are varied and in the main have certain general characteristics which aid in the recognition of the disease. In the earlier stages, and before the patient has become a thorough slave to the habit, he is apt to show marked symptoms of hysteria. At times states of apprehensiveness and anxiety develop; the patient readily becomes flustered, often develops mild suspicions, is decidedly pessimistic and hypersensitive, affirms that old friends are forsaking him, that all his actions are misinterpreted. Soon ethical defects become more or less pronounced. A tendency to lie, particularly when questioned in regard to his failing, is developed, and as action becomes more difficult the fabrications increase in scope and variety. The sense of duty becomes more and more blunted till it finally disappears. . . . The whole character deteriorates and the defects are in many respects similar to those belonging to certain stages in alcoholism although they are altogether different from others.

---

[13] Luzzato, R.—Uber die Natur und die Ursachen der Morphinglykosurie Arch. f. exper. Path. u. Pharmakol. Leipz. 1905. LII. 95-106.

[14] Paton, S.—Psychiatry. 1905.

. . . Hallucinations and delusions may develop, although they are not usually present unless the morphinism is complicated by alcoholism or the effects of some other drug. . . . Moreover, these patients are not uncommonly sufferers from psychaesthesias, paraesthesias, or less frequently hyperaesthesias."

Thomas C. Allbutt—1905.[15]

"Autopsy is rare in cases of uncomplicated morphinism. The only important point herein is the state of the heart. Schweninger and others allege that fatty degeneration of the heart is to be found in these cases after death. I have no positive facts to guide me to an opinion on this matter; but on clinical grounds I have seen no reason to suspect its presence, either in the course of malady or in a prevalent mode of death. To adduce, in proof of this assertion, cases in which other organic degenerations are found is to offer proof of too much or too little. The testimony of the best authors seems to be opposed to the belief that fatty heart is a direct consequence of morphinism. Wittowsky's papers are helpful in this aspect of the matter. The observations of Binz on the fall of blood-pressure in acute poisoning of animals by morphine have little bearing on chronic poisoning. Bell says that chronic poisoning by morphine promotes hepatic steatosis."

F. Chotzen—1906.[16]

This author reports the histories of two cases who during withdrawal showed marked psychoses, the clinical picture of which was quite clearly amentia. He states:

"Nearly all authors agree that the chronic abuse of morphin, in contradistinction to other poisons, gives rise to no special psychosis (Levinstein, Erlenmeyer, Obersteiner, Heiberg, Deutsch, Wernicke, Kräpelin, Ziehen, and others). When mental disturbances occur in chronic users of morphin, these are referred for the most part to contemporary complicating poisoning by other poisons, especially alcohol, chloral hydrate, and cocain (Jastrowitz, Erlenmeyer, Kräpelin, Ziehen, and others). On the other hand, in the opinion of authors in general, mental disturbances arise nearly always during abstinence, on sudden withdrawal, and without exception in confirmed addicts. The occurrence of these psychoses of abstinence seems to be limited to morphin withdrawal: the complications are of little moment, especially the most frequent one, due to the combining of cocain with morphin. This leads to no symptoms at all during abstinence, while chronic intoxication quite uniformly produces psychic disturbances: in this respect, as Kräpelin says, it most closely resembles alcohol. On the contrary, there is a decided contrast in this regard between it and morphin, which Ziehen particularly notes.

"The forms of mental disturbance in abstinence from morphin do not offer the well defined picture of a specific psychosis, yet they have by no means been sufficiently analyzed. For the most part they bear the mark, according to Levinstein's characterization, of the delirium tremens of mania for morphin. It becomes directly apparent, however, on examining the description of the psychoses occurring during abstinence from morphin given by a number of authors, that very different states are included there. All the writers have described anxiety states, depression, and mania."

---

[15] Allbutt, T. C.—A System of Medicine. 1905.

[16] Chotzen, F.—Zur Kenntnis der Psychosen der Morphiumabstinenz. Allg. Zeitschr. f. Psychiatrie. u. psych.-gerichtl. Med. 63. 1906. p. 786-803.

* * * * *

". . . But it is very evident from the different descriptions, especially from the great variation in duration of the psychoses, that by no means are all the psychoses of morphin abstinence to be regarded alike, and therefore not all can be brought into comparison with the same object. We must expect the utmost difference of conditions in morphin abstinence. Sometimes there are abnormal persons who become morphin addicts, such as Erlenmeyer refers to as disposed to certain neuroses and psychoses, Levinstein as nervous individuals. Jastrowitz describes a strong tendency, present in every crisis of delirium, to influences predisposing to the occurrence of abstinence psychoses. Whenever depression, ideas of compulsion, and the like have followed withdrawal, it can be safely assumed that they were present before using morphin, were in abeyance during that time, and reappeared on withdrawal.

"Sometimes also indications are apparent of a congenital psychopathy. Erlenmeyer and Jastrowitz describe hysterical symptoms as a regular manifestation, the former describes psychic disturbances of a purely hysterical nature, and Kräpelin has seen during morphin withdrawal a distinctly hysterical twilight condition with convulsions. But aside from this, pure abuse of morphin is rare, that use commonly being accompanied by abuse of chloral, alcohol, cocain, or chloroform. With the exception of cocain, it is doubtful if these take part in the causing of psychoses in abstinence, and at any rate they are not uniform as to the form of the disturbance that occurs. They are accompanied by a great multiplicity of congenital and acquired psychotic manifestations, but, because of the confusion of these, there is a strong probability of very complicated and obscure psychoses. The close resemblance also to alcoholic delirium tremens is certainly supported in many cases by more than a mere external similarity when alcoholism is a complication. I have seldom had an opportunity to see an uncomplicated case, but variations of alcoholic delirium have been noted everywhere in recent literature, sometimes very decided ones.

"Recently I have been privileged to see in close succession two chronic morphin addicts with well marked psychoses subordinated to a very definite clinical picture, that of amentia. In my belief this observation has nothing accidental about it, but it indicates that an analogy for the psychoses of morphin abstinence is to be expected far less in alcoholic delirium tremens than in the group of exhaustion psychoses and those related to them, an enlightening aid in understanding a large part of these psychoses."

* * * * *

"Closely following withdrawal treatment occurred an acute psychosis, beginning with marked confusion, and characterized by complete disorientation, misconception of the patient's surroundings, restlessness, and fantastic delirium. At the same time a notable loss of strength occurred, so that speedy demise was prognosticated by the physicians. On improvement of the complete disorientation there appeared extreme delirious illusions of vision, afterward numerous auditory illusions, hallucinations of smell, and hypochondriacal sensations, all connected with wholly phantastic dream delirium and confabulations. Active, restless movement supervened, impulsive, altogether incoherent speech, and a strong tendency to be diverted, but nevertheless continual attraction to external impressions for the most part falsely conceived. His memory was much weakened and there was particularly extensive disturbance of apprehension. He failed to understand simple questions, heard wrongly, mistook himself for another person, misunderstood, and misinterpreted. Even in periods of rest illusory misconceptions were frequent as to his surroundings and perception of events. What he apprehended in part correctly was transformed in a characteristic way into very strange and impossible images, just as in dreams.

"His disposition changed constantly, being at one time excited, at another anxiously depressed, at another exalted with a tendency to ideas of grandeur.

"His strength was much depleted, his heart action bad, his speech without force and completely exhausted.

"After eight weeks a rapid improvement began, and in a few days he was cured and had completely recovered his insight.

"The entire course of this attack, the acute origin with physical failure, the prominence of the dream confusion, the great difficulty in apprehension, the illusional and hallucinatory falsifications of perceptions, the extreme restlessness, the duration of eight weeks followed by recovery, all these are the well known characteristics of the group of psychoses to which Kräpelin has given the name of 'exhaustion psychoses,' and the instance related falls under the designation amentia.

"No other form of psychosis deserves consideration. No infection was present, the temperature only once reaching 37.8°. In disproof of katatonic disease stands the absence of all motor symptoms in the narrow sense, and in disproof of manic confusion the preponderance of disturbances of perception and the concurrence of the psychosis with physical exhaustion.

"All these indications hold also for the second case, which ran its course entirely under medical observation. I myself merely had an opportunity of examining the patient once, and must therefore be satisfied with reporting the case briefly."

* * * * *

"These two psychoses correspond and afford typical examples of the form of disease described. There is no characteristic which enjoins their association or requires their separation. Especially do they agree with certain rare forms which stand out a little from the number of acute psychoses arising in connection with exhausting causes by reason of the fact that in them the disturbances of perception and the illusional dream life, the confusion and the absolute incompetence for any kind of associative effort rule in fact the whole picture and recur with invariable regularity in their etiology in connection with insufficient nourishment, constant loss of sleep, and business strain.

"But when again we find in the psychoses reported above a series of traits described by authorities as characteristic of the psychoses of morphin abstinence, this does not show a specific character in these psychoses, for these traits belong also to the exhaustion psychoses and show rather a correspondence of recognized morphin psychoses with those of exhaustion.

"So also the disturbance of speech which characterized both our cases is mentioned as an abstinence phenomenon (Levinstein). It is an almost constant attendant of the exhaustion psychoses referred to. In those too we find the development in two stages, a very stormy delirious initial stage and a later stage of repose, in which the associated insufficiency becomes most certain. Here occurs the tremor which Kräpelin speaks of as found also in the delirium of collapse, and which Ziehen says is very frequent in all exhaustion psychoses. Thus the resemblance to alcoholic delirium which is always emphasized in respect to morphin psychosis, is pronounced also in these exhaustion psychoses. Actually in one of our cases, a young woman who certainly had not been drinking and who became ill herself only from insufficient nourishment and loss of sleep while fatiguing herself in the care of a sick relative, it was said in the beginning of her illness that she was 'typically delirious.' If it is possible for known cases of the acute delirium tremens of morphin users to correspond with the psychosis of collapse, so too the description of the chronic or milder forms reminds us of similar phenomena caused by exhaustion. Thus Erlenmeyer describes as a mild form of delirium tremens a half conscious dream condition of laughing, muttering, gesticulating (as in a dream) on the borders of hallucination, at other times numerous hallucinations and amnesia. Levinstein mentions a chronic form, developing in the period of intoxication and continuing into the period of abstinence, with changeable temper, generally settled cheerfulness, interrupted only for brief periods by anxiety states. Some individuals pass the day in depression, at evening are mildly excited and subject to sensory delusions, to tremor of the hands and muscular contractions. So they can be drawn out from their depressed or excited frame of mind. This description bears considerable resemblance to mild hunger delirium in course of pregnancy or the puerperium and other chronic wasting processes.

"We do not think that in the characteristics referred to we see the signs of a special variety of morphin abstinence psychosis, but believe on the contrary that a part of this case coincides with the psychoses of other inanition processes."

* * * * *

"We might look for the origin of this psychosis in events which result also in 'exhaustion' of the nervous system. Jastrowitz says that acute mental disturbances occur most readily in morphin abstinence when little nutriment is taken and loss of sleep, diarrhea, and agitation have still further depleted the body. The remotest cause of disease therefore lies in an intoxication of the body. In our two cases the illness followed withdrawal or coincided with it. Complications do not enter into the question here. In the first case morphin was taken during the last part of the time only in small doses and no new injury occurred: in the second case strenuous activity was entered on and a more decided degree of exhaustion resulted than when the patient began withdrawal. During this period the premonitory symptoms soon appeared and, after renewed excess of fatigue, the outburst of the severe psychosis. But here too the chronic morphin intoxication with its consequences must first have prepared the soil on which so severe a bodily and mental prostration could develop. In both cases the physical weakness was very decided, in the first case threatening life. Neither cocainism nor alcoholism can properly be charged with these psychoses, as has been said above. The symptoms supply nothing characteristic of either of these factors; on the contrary, they point entirely to the form of malady known as the result of exhaustive disease. And such is chronic morphinism with its severe infirmity. Great impairment of nutrition and metabolism constitutes a major symptom in morphin intoxication, and it is this which finally brings the body into the perils especially to be dreaded during withdrawal. Levinstein says that in nearly all patients a condition of weakness supervenes on the second or third day of withdrawal, which may precipitate a dangerous collapse when the withdrawal is sudden, and which indicates that violent psychic disturbances tend to follow abrupt withdrawal. The concurrence of physical and psychic disturbances leads to the conclusion that they spring from a common source, and the typical clinical picture in our two cases shows that this conclusion is justified. When Jastrowitz writes 'conformably to the recognized character of known forms of disease, obscure psychoses, sometimes mania, melancholia, or true paranoia do not arise, as in chronic alcoholics, as a consequence of withdrawal, either during or following it,' it may be remarked that withdrawal, by hastening physical collapse, favors also the corresponding psychoses, and that no pronouncement is valid respecting the psychoses of collapse, which are not reckoned in this connection. Therefore, when we undertake to enumerate the psychoses of morphin abstinence, we believe, with regard to psychopathic conditions and other complications, that in many cases consideration should be given primarily to the psychoses of the amentia group, as we prefer to call them with Stransky.

"Certain predisposing causes also play a part here in my opinion. Both of the patients reported above were neurasthenics. These and sufferers from insomnia are especially susceptible, as Kräpelin and Jastrowitz remark, to morphin. But in our experience it is also the neurasthenics who incline to develop exhaustion psychoses at the first opportunity. Repeatedly did we learn from our patients that they had previously had symptoms of chronic nervous exhaustion. In this way it seemed to us certain that in many instances patients who recover from amentia do not become altogether well, but still manifest nervous symptoms, as Racke and Stransky have also observed. This is where the danger of relapse exists for these patients.

"That those who become morphin addicts are plain neurasthenics and victims of insomnia affords an explanation of the remarkable fact that in chronic poisoning of the body there appears a symptom complex to which has been ascribed a very precise etiology, that of pure nervous exhaustion. If morphin does away with the fatigue symptoms of the neurasthenic, possibly at the same time it interferes with physiological regeneration and so increases the fatigue symptoms to the point of exhaustion. But this theory applies also to a single administration of the poison; for the common view that recovery consists in the removal of certain metabolic products is placed on a secure foundation by the proof of an exhaustion antitoxin and an opposing antitoxin (Weichardt). Whether we believe that morphin exerts its peculiar effect by accumulating normal metabolic poisons or by forming specific poisons by its decomposition (Marmé), the psychic disturbances in either case would be the results of a chronic intoxication like the other symptoms of morphin intoxication and abstinence, which latter Jastrowitz insists are not antithetical to the symptoms of poisoning, but are the same and have merely been retarded for a little while by fresh doses of morphin and its tonic effect. Such a tonic effect is recognized, although it is not known with certainty what it depends on. In the second of our cases it was clearly seen in the beginning of the illness, for after every injection the speech became once more forceful and the articulation distinct, but after the effect passed off was greatly diminished and uncertain. We see the same in chronic alcoholism in respect to the anxiety, the tremor, and other symptoms of abstinence. So the symptoms of abstinence are the regular symptoms of intoxication and their psychic components are to be regarded as products of chronic poisoning. Jastrowitz explains that chronic morphinism creates neurasthenia. Thus chronic poisoning indirectly produces the symptom complex of amentia. We also know from other clinical experiences that this symptom complex is evoked by toxic, especially by infectious influences. Consequently, although it is closely associated with exhaustion as a cause and is quite uncomplicated, as we must recognize, still the separation from cases of infectious origin cannot be substantiated. Nothing further will be said of this here; there may possibly be an opportunity elsewhere. Stransky and Strohmayer have recently treated this question amply, and the former agrees with the majority of authors that it is impossible to separate toxic infectious conditions from conditions of exhaustion, a fact borne out by clinical observation. The more hallucinatory form of confusion, which Kräpelin no longer distinguishes from the asthenic form, is often seen in acute infectious diseases. Easy transitions occur between the 'delirium of collapse,' 'amentia,' and 'infectious fatigue conditions,' and we especially see in chronic infectious diseases how the symptoms of exhaustion, which here find their physical correlation in cachexia, mingle with those we ascribe to intoxication.

"The symptoms of exhaustion are the expression of disordered nutrition, whose origin, apart from that in internal disturbances of metabolism, may lie in a toxic causation from without, whether from organic or from chemical poisons (see Stransky). If Stransky attributes amentia specifically to the indirect effect of organic poisons, the cases reported here furnish evidence that chemical poisons have precisely the same effect. Finally, as we see in the action of morphin, they produce the same cachexia as chronic infectious diseases, and in chronic morphinism with its severe gastrointestinal disturbances and its effect on almost every gland there is abundant opportunity for autointoxication by reason of secondary disturbances of metabolism. Of special interest here is the analogy between very frequent intoxication with a chemical poison and alcoholic intoxication. We must recognize too the exhaustion symptoms of the alcoholic cachexia (author); the symptom complex of this intoxication may also be distinguished from the amentia group. A difficulty arises here in separating Korsakoff's psychosis, which is closely related to this. This relationship is shown by the development of psychoses of the amentia group on a foundation of chronic alcoholism, and by the transition to it of cases of polyneurotic psychosis, in which the delirium is often designated 'asthenic.' We must recognize exhaustion symptoms, therefore, as the indirect result of poisoning by chemical poisons."

Otto Schütz—1908.[16a]

The author presents the autopsy findings in a woman, 23 years, who suffered from an arthritis and died from morphin poisoning. The histologic findings are given in the following:

"In Marchi preparations from the upper level between the first and second cervical nerves there was considerable degeneration of the nerve fibres in the entire extent of the posterior columns and in the course of the nerve paths beside the cerebellum, evidenced by a variety of large round or more often irregular, sometimes distinctly annular, black spots. The posterior and anterior roots also were marked with black streaks.

"In Weigert-Pal preparations from adjoining regions, patches of degeneration of nerve fibres were perceptible, particularly in the posterior columns, and also isolated patches at the edges of the lateral columns. The patches were small, diffusely distributed, and stood in no perceptible relation to the course of the blood vessels. In the posterior column the columns of Goll and of Burdach had undergone the same change. The areas of the afferent nerve roots were unaffected. In sections from the cervical cord at different levels, stained with hemalum-Van Gieson, picrocarmin, and nigrosin, there was perceived an increase of the glia in the column of Goll with increase of nuclei, appearing in small patches and coinciding with the degeneration. The blood vessels were unaltered. There were no signs of inflammation. The gray matter, particularly the ganglion cells, was unaffected.

"In the thoracic cord also the anterior and posterior roots, the borders of the lateral columns, and to a less extent the posterior columns in Marchi preparations were similarly degenerated. In sections treated by the other methods referred to above there were no pathological findings.

"In the lumbar cord the lateral and posterior columns were less degenerated, but the anterior and posterior roots very much so.

"Finally, thin plates were removed from the sides of the left forefinger, previously treated with Marchi, in such a way that the digital nerves were included with their branches. In nearly all the preparations nerve bundles were seen which were affected throughout their whole length and so altered that they seemed to have been dyed a deep black. There was no appearance of inflammation or of atrophy. The muscle fibres were normal in size, transverse stripes, number and appearance of nuclei.

"So there was degeneration of the nerve fibres in the lateral and posterior columns throughout the whole extent of the spinal column, but diminishing from above downward and limited in extent; degeneration of the roots; disappearance of nerve fibres with mild sclerosis in the posterior columns of the cervical cord in the form of small scattered groups; degeneration of peripheral nerves.

[16a] Schütz, Otto—Anatomische Befunde an Rückenmark und Nerven bei einer Morphinistin. Neurol. Centralbl. 1908. Vol. 27. pp. 157-159.

"Anemic and cachectic conditions and diabetes were summarily excluded as etiological factors for spinal cord disease in this vigorous, well-nourished, far from bloodless girl. Chronic alcoholism did not come into consideration. So it would have been necessary to dispense with an acceptable explanation for the spinal cord findings if another chronic intoxication had not been established in the anamnesis."

John V. Shoemaker—1908.[17]

"The generative functions are depressed by opium, and in chronic poisoning the menses cease and men become impotent while under its influence. Passower has demonstrated that the abuse of morphine may occasion atrophy of the female organs. In a patient observed during two years it was inferred, from the early failure of menstruation, that the atrophic process began in the ovary. During the period named the uterus diminished in size by 1 2/10 inches and atrophy of the vulva was evident. The secretion of urine is lessened, but the bladder is often rendered irritable and urine is passed frequently in small quantities. On the other hand, partial paralysis, with retention, may occur. Althoff has proved experimentally that degeneration of the posterior columns of the cord in the dormal region was produced in dogs who had for a long period received hypodermic injections of morphine. This observation is in consonance with the clinical fact that morphine habitués, in some instances, manifest ataxic symptoms. This drug increases the amount of urea and phosphoric acid eliminated."

Ch. Achard, H. Bénard, and Ch. Gagneux—1909.[18]

These authors report experiments and conclusions as to the action of morphin on the properties of the leukocytes and their value as a means of diagnosing morphinism. The article is given herewith in full except for the protocols of the experiments:

"After having read, in a recent article, of the action of anesthetics on leukocytes, it seemed interesting to determine that of another drug of a similar nature and the use of which is not less extensive in daily practice—morphin.

"This alkaloid diminishes both the resistance and the activity of leukocytes. It should be remembered that the resistance of these cells is measured by cytolytic deformities, produced by a hypotonic salt solution. As to its mechanical action, its value is estimated by the capacity for absorbing either foreign cells (sterile yeast of thrush), or dissolved substances, the incorporation of which into the protoplasm gives rise to vacuoles stained with neutral red (erythrophilic vacuoles); in vivo, after an injection of morphin, the resistance and activity of the white blood cells is lessened, but this effect is only transitory. This is especially clear as regards the activity of the cells."

---

[17] Shoemaker, J. V.—Materia Medica and Therapeutics. 1908.

[18] Achard, Bénard and Gagneux—Action de la morphine sur les propriétés leucocytaires. Bull. et Mem. Soc. med. Hopitaux de Paris. 1909. Vol. 28. Ser. 3.

* * * * *

"In vitro, in very weak isotonic solutions of morphin, the white cells also lose their resistance and activity. We have even determined, with M. Ramond, that, when they have previously absorbed yeast or when they have been filled with erythrophilic vacuoles, remaining in the morphin solutions makes them give up these corpuscles and vacuoles. They are, therefore, manifestly sensitive to morphin.

"As the sensitiveness of the organism to the morphin becomes readily apparent and since tolerance to this poison is easily established, we have been led to investigate whether the sensitiveness of the leukocytes to morphin would vary as well, in individuals addicted to the alkaloid, as in those not addicted.

"In vivo, we observed that an injection of 4 cg. of morphin chlorhydrate, in a morphinist, scarcely affected the leukocytic resistance or activity, while the same dose, in an individual not addicted, clearly lessened these two properties."

* * * * *

"These results made us search further and measure the sensitiveness of the leukocytes to the morphin, in order to see if it would not be possible to identify the morphinized subjects in this way. With this in view, we placed the leukocytes in a series of alkaloid solutions and sought one that maintained a minimum leukocytic activity. The solubility of this solution gave the measure of the sensitiveness of the while cells to the morphin. This sensitiveness was noted, as well for the incorporation of the sterile yeast, as for the formation of erythrophilic vacuoles. The action of the yeast was perhaps more precise, but that of the neutral red was certainly simpler and seemed to us to suffice for the clinical investigations."

* * * * *

"In individuals not morphinized, we note that, with the yeast, the sensitiveness of the leucocytes to morphin is expressed by 500 and 400 and in morphinized subjects it is only 100 and 200; with the neutral red, its value is 500 in the former and 300 to 500 in the latter. You will note that the subject with the least tolerance to morphin, among the addicted ones, is also the one whose leucocytic sensitiveness is expressed by the lowest value in the two reactions.

"We know that young children are more sensitive to morphin than adults. But, we have also learned that their white cells are less tolerant to the alkaloid."

* * * * *

"The tolerance of the leucocytes for morphin continues for some time after suppression of the toxic substance, then it disappears. We observed this in an asthmatic individual, who was subjected for a few days to morphin injections.

About 15 days after the remedy was stopped, he still showed quite a leucocytic tolerance, but at the end of a month, he returned to normal."

* * * * *

"Heroin, which is a derivative of morphin, causes analogous reactions as far as the white cells are concerned.

"In vivo, it lessens in the same way the leucocytic activity."

* * * * *

"In vitro, the leucocytes undergo in the solutions of heroin of 1:200 a lessening of resistance and activity. But this sensitiveness to heroin is less also in a heroinist."

"In order to account for the specificity of the reaction, we endeavored to find out if, in spite of the chemical relationship between morphin and heroin, there was any difference in their action. But we found that the leucocytes of a heroinist acted like those of a normal individual with respect to morphin, and that, reciprocally, those of a morphinist reacted like those of an individual normal with respect to heroin."

* * * * *

"The measurement of the leucocytic sensitiveness to morphin and heroin, by the neutral red method, gave us confirmatory results."

* * * * *

"Summing up, the leucocytic reaction, which we designate under the name *leuco-diagnosis,* makes possible the identification of morphinism, the supervision of demorphinization, and the distinction between heroinism and morphinism."

O. Jennings—1909.[19]

Jennings states that "the morphia habit" is a "psycho-somatic affection" in which mental and physical troubles are interdependent, conditioned the one by the other. As to pathology, he states that Burnett has shown, by post-mortem examinations, certain microscopic changes described as follows:

"The stichochrome nerve cells stained diffusely and unevenly and were very irregular in outline, the chromatic bodies were enlarged and minutely and irregularly subdivided.

"The cells of the cortex and medulla were extensively altered, showing clefts of the cell bodies, uneven loss of, and minute subdivisions of, the chromatic bodies. In areas these bodies were massed and fused together. Their greatest loss was about the nuclei, but about some nuclei, the chromatic substance was heaped in irregular masses and rods.

"The irregularity of the chromatolytic process, the ragged cell borders, the clefts of the cells and the frequently central chromotolysis with the extruded or eccentric nuclei, were distinguishing changes in this case."

---

[19] Jennings, O.—The Morphia Habit. 1909.

M. Chartier and D. Morat—1909.[20]

The findings on the changes in the blood picture during chronic morphin and heroin intoxication as described by these authors are covered in Morat's Thesis of 1911, from which we shall quote at length. Therefore we shall not consider their joint paper here.

C. L. Case—1910.[21]

This author states that there is no structural pathology in chronic opium intoxication but that pathologic changes are entirely of a functional nature. The nervous system is under the benumbing influence of the drug and all vital functions are sluggishly and imperfectly performed. What is commonly spoken of as "the craving" is not a craving at all, but a physical condition.

E. Kräpelin—1910.[22]

"The psychic effects of morphin, so far as they are known at present, differ widely from those of alcohol, and consist in facilitating and stimulating intellectual processes and in rendering psychomotor activity difficult. This behavior, which has been confirmed by studies of morphin addicts, enables us to understand that morphin intoxication passes into a sort of pleasurable dreaming, in which confused shifting images take possession of the imagination, while at the same time a gentle relaxation fetters the limbs. Morphin, therefore, is by no means intrinsically a hypnotic, as physicians still generally believe. Rather do we understand that morphin addicts feel themselves stimulated under the influence of the remedy to mental work which they could not accomplish in their ordinary constant condition of purposelessness. But the most dangerous feature of morphin action is unquestionably the peculiar, restful sensation of pleasure, which differs very markedly from that of alcoholic intoxication in the total absence of signs of psychomotor excitation, of conscious desire to be active."

* * * * *

"Still further, in certain cases a disease-picture may develop in consequence of actively increased agitation which bears a very close resemblance to the delirium tremens of drunkards, and in which the uncertain movements and the tremor of the hands is accustomed to appear in the same manner. In other cases the preponderance of auditory illusions suggests rather the delusional state of alcohol or cocain. Usually this state lasts only a few hours or at any rate not more than a few days: once only have I seen it prolonged over several weeks. Here an unmistakable abuse of alcohol had taken place with the object of withdrawal. The criteria of distinction from alcoholic delirium recently proposed by Abraham (exaltation with corresponding mixture of delirious outbreaks, slight disturbance of perception, of attention, and of orientation, positive insight into the disease) neither characterize the majority of delirious episodes in morphin addicts, nor differentiate them adequately from alcoholic delirium. The infrequency of such delirium, even in those markedly addicted, indicates that different influences are at work here from those usual in alcohol and cocain; perhaps one of the other drugs so freely used by morphinists should come into consideration here. Apparently morphin withdrawal favors the occurrence of such delirium, like feverish diseases or wounds. Now and then hysterical seizures are observed during the withdrawal period, with sensory illusions and convulsions.

---

[20] Chartier et D. Morat.—Les Variations de la Formule sanguine chez les Morphinomanes et les Héroinomanes au cours de la désintoxication rapide par la Méthod de Sollier. Compt. rend. de la Soc. de Biologie. June 25, 1909.

[21] Case, C. L.—The Pathology and Treatment of the Morphine Habit. Med. Council. 1910, XV, 307-311.

[22] Kräpelin, E.—Psychiatrie: Ein Lehrbuch für Studierende und Ärzte. 8th ed. 1909-1915. Vol. 2. Klinische Psychiatrie. p. 206-228.

"In other tracts also of the nervous system the tremendous overturning becomes apparent which is produced by withdrawal of the accustomed stimulant. There occur involuntary movements and spasms in the limbs, spasms of the calves, contractions of the limbs, trembling, asthmatic attacks, spasm of the diaphragm, convulsive cough, paresis of accommodation, tenesmus, vesical spasms and paralysis, rumbling, rattling and pain in the stomach, vomiting, cardiac palpitation, but especially fainting and dangerous collapse with sudden rapid diminution of heart action, which under some conditions recurs repeatedly and may directly end in death. The secretory activities, which have been depressed under the influence of morphin, exhibit a quick transitory increase of considerable extent: saliva, tears, and perspiration are secreted abundantly, and prolonged severe diarrhea occurs: sometimes albumen appears in the urine. Appetite declines greatly; the body weight rapidly diminishes. The severity of the symptoms of withdrawal varies to an extraordinary degree. It depends on the size of the dose, the duration of addiction, the general condition of the patient, and the individual tendency. Sometimes the disturbances are limited to a little diarrhea, sweating, excitability, and insomnia, while in other patients the condition becomes exceedingly severe, threatening life. My experience, however, does not include an instance of withdrawal wholly without discomfort. When the manifestations are very mild or the health altogether undisturbed, morphin is unquestionably being supplied clandestinely. Once I learned of a deception of this sort by finding the patient, a colleague, enjoying a sleep when I paid him a visit."

Daniel Morat—1911.[23]

This author reports the most extensive pathologic studies of chronic opium intoxication which our search of the literature has revealed. These studies were made on patients undergoing Sollier's method of rapid reduction and detoxication. Morat's findings were the result of the study of thirty-four cases selected from one hundred forty-six. This selection was made in order definitely to exclude all cases suffering from intercurrent conditions—abscesses, malaria, acute alcoholism, syphilis, etc.—which might have vitiated the results.

---

[23] Morat, D.—Le sang et les sécrétions au cours de la morphinomanie et de la désintoxication. Thèse de Paris. 1911.

To follow satisfactorily the blood changes, four specimens were necessary, the first before any reduction in the morphin, the second three days after withdrawal, the third fifteen to twenty days after withdrawal, and the fourth forty days after withdrawal.

The Blood in Morphinists and Heroinists During Intoxication.—In these studies it was found that there were no marked changes in the blood during the intoxication—while the patients were taking their usual dose—and the pallor of some of these cases should be attributed to peripheral vasomotor phenomena rather than to anemia. Studied by the method of Hayem, coagulation was nearly normal although in many cases a delay of 10 to 15 minutes was noted.

Red Cells.—While the number of red cells was variable, most patients showed an increase—the count being generally about 5,000,000, —in one case 5,825,000. The increases were usually in young people who in general had many abscesses.

The hemoglobin was lowered varying between 0.90 and 0.70—in one heroinist 0.55. The size of the red cells was normal, only a few macrocytes and microcytes were found, the latter being the more noticeable. There was no poikilocytosis. The color of the red cells was normal and granular red cells as shown by cresyl-blue were not more common than in normal blood.

By the method of Vaquez [24] and Rubierre the resistance of the red cells as compared with normal blood was diminished. With the same solutions of NaCl normal blood hemolyzes completely at 0.30, beginning hemolysis being at 0.38, while that of morphinists and heroinists completely hemolyzes at 0.36 with its beginning at 0.44.

White Cells.—Morphin intoxication does not affect the number of leukocytes which varies between 5,000 and 10,000. In cases with abscesses the number is higher—14,500 and 15,500 respectively in two cases.

The same is true of the differential count which remains normal except in cases with intercurrent infections. The polynuclear neutrophiles vary between 52 and 70 per cent. Eosinophiles vary from 0.5 to 3 per cent. We find sometimes, but rarely, a mast cell. The transitional forms vary between 0.5 and 4 per cent; the large mononuclears between 2 and 5 per cent. Finally, the average number of mononuclears is 8 to 12 per cent and that of the lymphocytes from 12 to 24 per cent.

---

[24] Vaquez, H.—Des méthodes propres á évaluer la résistance des globules du sang. Comptes rendus de la Société de Biologie, 5 février, 1898, p. 159. Semaine Médicale, 1898, p. 611.

In dry smears, however stained, there are generally found degenerative changes in a certain number of leukocytes. A long series of such examinations together with wet-chamber examinations in the same and different individuals indicate these changes are not artifacts. They are practically absent in normal blood while in morphinists 2 to 3 per cent of the polynuclears and many of the large mononuclears show alterations of shape and color, vacuoles in the nucleus and protoplasm, a reduction of the protoplasm to a reticulum and a scattering of granules in the polynuclear eosinophiles. These changes are also seen in wet-chamber specimens stained with cresyl-blue while staining with neutral red shows two to three per cent of the nuclei stained—an indication of death of the cell element.

The white cell resistance was studied by the method of Achard and Ramond [25] and after comparing a large number of counts of intoxicated patients with those of normal individuals, it was determined that the total figure expressing the resistance of the polynuclear leukocytes generally varies in intoxicated individuals between 280 and 400, having usually an average of between 290 and 360, while healthy individuals present a figure falling between 432 and 469. The figures expressing the resistance of the mononuclears, lower generally than the figure of the polynuclears, vary between 250 and 300 and are again lower in the case of intoxicated persons than those expressing the resistance of mononuclear leukocytes in normal individuals.

To sum up, cases of morphin intoxication offer lower leukocytic resistance than normal individuals.

The Blood of Morphinists and Heroinists during Rapid Withdrawal. Coagulation takes place more rapidly even than in normal blood.

Red Cells.—During the period of reduction and especially in the first days of abstinence, definite morphologic changes occur in the red cells,—macrocytes, microcytes, poikilocytes and deeply colored red cells being found in much larger numbers than during intoxication. There is also an increase in the granular red cells which return to normal about the fifteenth day after withdrawal. The red cell count increases up to about the fifth day of abstinence from 500,000 to 1,000,000 or more; then it decreases to normal or below by the eighth to twelfth day.

---

[25] Ch. Achard et Ramond—Récherche de la résistance leucocytaire. Comptes rendus de la Soc. de biologie. 16 janvier, 1909, p. 110, et Semaine médicale, 1909, p. 47.

The hemoglobin in one cubic millimeter of blood, determined by Henocque's hematospectroscope and the double chamber of Hayem, is lowered during the reduction and withdrawal, reaches its original point again about the thirtieth day and still later returns to normal.

The percentage of hemoglobin in the individual red cell diminishes much more during the period of increased cell counts but increases again more rapidly than the hemoglobin content per cubic millimeter on account of the decreased number of red cells.

The red cell resistance, lessened during the period of intoxication, increases during withdrawal reaching its maximum about the tenth day; then slowly diminishes until the fortieth or fiftieth day when it reaches its original state, a little below that of the normal cell.

During the period of reduction and above all during the days which follow withdrawal, the total number of white cells per cubic millimeter undergoes an increase analogous to the increase of the red cells. It is important, however, to state that the leukocytes do not reach their maximum on the same day as the red cells. It is, in fact, three or four days after the latter that the curve of the white cell reaches its peak. It is but slightly increased during the reduction. The ascending curve of the leukocytes rises quickly from the beginning of withdrawal until about the fifth day after and remains stationary until about the seventh day. The number of leukocytes exceed the original number by an average of from 5,000 to 11,000, sometimes doubling and trebling it. Then the curve begins to descend more slowly than it rose, falls to the original figure on from the twentieth to the twenty-fifth day after withdrawal and thereafter remains stationary.

Leukocyte Picture.—Variations in the leukocyte picture follow in general a remarkably constant course which can be expressed thus:

1. During the period of reduction and of withdrawal, great polynucleosis.
2. During the period of convalescence, mononucleosis and eosinophilia, together with the appearance of abnormal specimens.
3. The return to normal on from the thirty-fifth to the fortieth day after withdrawal.

PLATE I

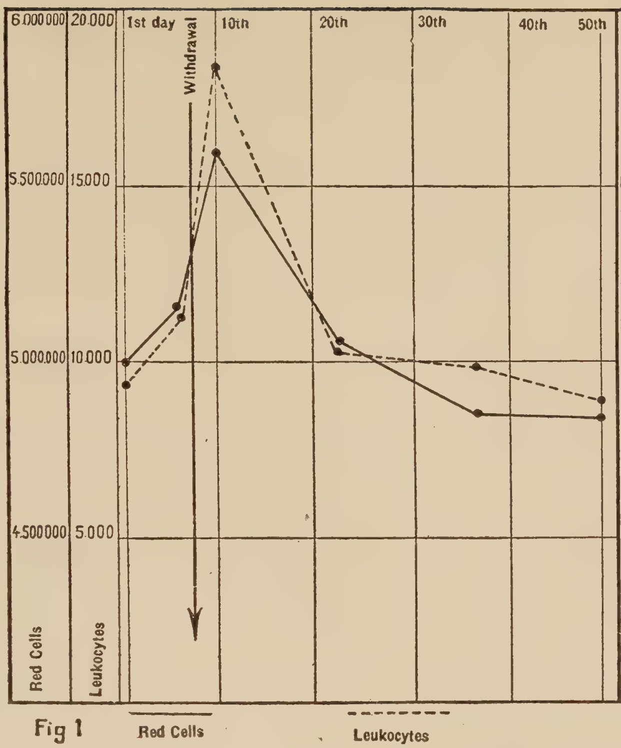


Fig 1

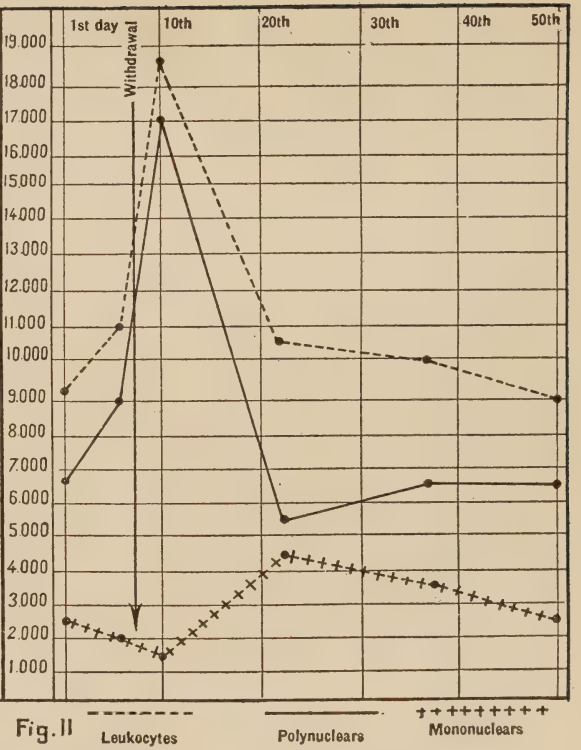


Fig. II

NUMBER PER CUBIC MILLIMETER

The red and white cell counts are shown in Plate I.

The author gives in detail the numerical, morphologic, and structural changes in the white cells at various stages of treatment and points out their diagnostic and prognostic significance. These and certain degenerative changes begin with the reduction of the drug and end with the completion of convalescence. The leukocytic resistance is lowered during the period of withdrawal.

The same hematologic changes were observed in a tolerant dog when withdrawn from the drug. These changes were also shown in two patients who had undergone gradual reduction treatment when, afterwards, they were subjected to the detoxication treatment of Sollier.[26]

In review Morat states—

> 1. "In red cells, a cell increase, an alteration of the cells, an increase in cell resistance and during convalescence, a complete return to the normal state.
>
> 2. "In the white cells during the period of withdrawal, a marked polynucleosis followed by a mononucleosis, the appearance during the mononucleosis of eosinophiles and abnormal forms, pronounced leukocytic changes, a lessening of leukocytic resistance and during convalescence a return to the normal state."

From now on, according to Morat, we definitely can recognize the similarity between these non-febrile reactions of the period of detoxication and the reactions in cases of acute infections which, however, have also an elevation of temperature, but which present polynucleosis during the acute period, mononucleosis with the appearance of eosinophiles and of large macrophages during convalescence, and also an increase in the red cell resistance and a decrease in the white cell resistance during the infection, with a return toward normal during convalescence.

Morat reports as a result of studies of the resistance of the red cells of persons suffering from chronic morphin or heroin intoxication as compared with those of healthy individuals as follows:

> "The red cells of an individual intoxicated with morphin or heroin undergo, in solutions containing one or the other of these poisons, a hemolytic change of an equal degree to the change in the red cells of healthy individuals in the

---

[26] As a digression it is interesting to point out that this is suggestive possibly of incomplete elimination, i.e., morphin storage, and may account for the so-called "post-withdrawal" symptoms mentioned by some authors, who claim that mild withdrawal symptoms persist for weeks or months after stoppage of the drug and eventually lead to relapse. In this connection it would be of interest to determine the leukocytic changes under different methods of treatment and detoxication.

same solutions. There does not, therefore, appear to exist in the red cells of intoxicated individuals, a selective affinity toward one or the other of these two poisons. On the other hand, in a healthy individual, in morphinists and for the greater part in heroinists, at least in those of the latter class in whom the intoxication is recent, heroin is definitely more destructive to red cells than morphin."

His studies of the white cell resistance were inconclusive.

The secretions and excretions.—The Liver. Morat found that the area of liver dullness in intoxication was lessened as a rule in cases of long standing and normal or slightly enlarged in recent cases. Whether small or large the liver was sensitive and in some cases hepatic colic was noted. The author goes on to state that the liver function is retarded in chronic opium poisoning, the bile being diminished and urobilin and bile pigment appearing in the urine. He states that the glycosuria reported by certain authors was not observed by him.

Morat further states that in detoxication the liver function is excessive, the organ becomes tender and enormous quantities of bile are produced. This hyperactivity reaches its height about the time of complete withdrawal. He states that while this over-secretion of the liver quite reasonably might appear to be a means of getting rid of stored morphin Sollier was unable to recover morphin from the vomitus or stools at this time. He concludes that if morphin is excreted at this time it must be in the form of some derived product and that the greatly increased secretion of the liver is due to the detoxication treatment, to the release of the liver cells from the effect of the drug, and to increased nervous stimulation due to the removal of the drug's inhibitory action.

In the digestive tract the glandular elements likewise take on increased functional activity where formerly—during intoxication—they were inhibited. Salivation becomes intense and diarrhœa is a prominent symptom.

Albuminuria, the author states, does not result from chronic opium intoxication. During the period of suppression there is a marked oliguria, the urine is highly colored and contains phosphates and urates which persist often until the eighth day after withdrawal and are recovered from time to time during convalescence.

About fifteen hours after complete withdrawal there is often pain in the kidney regions, the oliguria becomes more marked with sometimes complete suppression of short duration. At this time the urine always contains albumen from ½ to 1½ gms. per liter and often larger amounts. This albumen consists almost entirely of serum and lasts but a few days.

Microscopic examination of the urinary sediment shows granular or cellulo-granular casts, the cells being polyhedral mononuclears from the uriniferous tubules and irregular cells in process of destruction.

Free cells found in the urine are the polyhedral vesical cells, small cells of the kidney tubules and destroyed polynuclears.

The author believes that the albuminuria is not due to a passive congestion of the kidney because of the rapidity of its development or to vasomotor disturbances or to a nephritis of auto-toxic origin caused by the presence in the blood of the products of cellular disintegration. He attributes the albuminuria to what Feullié[27] describes as "leukopathic albuminuria."

Feullié states that in certain affections there exists in the blood "pathologic leukocytes" or sick leukocytes, which, finding in the kidney an excretory organ, appear in the urine in the form of leukocytic casts and scattered cells. And, according to him, this leukocyte exodus through the kidneys causes albuminuria in several ways:

1. Directly through destroyed leukocytes.
2. Through the passage of albumen of the blood plasma, through the opening momentarily left by the leukocytes, during their diapedesis.
3. By the products set free in the blood by the sick leukocytes which act directly on the glomeruli, causing what Feullié calls "leukopathic glomerulitis."

It seems, therefore, that it is on the basis of this last theory that we must explain the albuminuria of detoxication:

The leukocyte changes observed in the blood of individuals during detoxication, the rapid appearance of the albumen, its appearance at the same time when the changes of the leukocytes in the blood are most marked, the presence in the urine of the leukocyte casts, the oliguria which one can explain by the obstruction of the urinferous tubules and which always ends with an outpouring of cellular débris, seem to place the albuminuria occurring in morphinists during detoxication in the group of leukopathic albuminurias described by Feullié.[28]

Morat states that the renal apparatus rapidly returns to normal on about the eighth day after withdrawal and kidney sequelae do not occur.

---

[27] Feullié. Leucopathies, métastases, albuminurie et ictères leucopathiques. Thèse de Paris. 1909.

[28] Loc. cit.

Abscesses, the Skin, the Teeth and the Sexual Apparatus. While many years may elapse without it, most cases of morphinism sooner or later develop infection with abscess formation in the localities most frequently used for the injections. These abscesses are painful, form slowly and usually contain a fetid pus rich in bacteria, generally staphylococci or streptococci. They may become confluent.

During detoxication when there is no suppuration and when all reason for infection has passed with the last injection from eight to twenty days after withdrawal new abscesses may develop. These are different from the preceding occurring in places where for long periods no injections have been made and they develop rapidly. The pus is benign or serous with few or no bacteria. The author considers them a phenomenon of counter-irritation due to the attraction of leukocytes to places where there existed previously a latent inflammation, insufficient in itself to produce an abscess. This sudden accumulation of leukocytes, the author states, can be explained by the presence in the blood at this period of degenerating leukocytes which find in these localities points of attraction.

The Skin. During detoxication there is an over-activity of the sweat glands which often becomes excessive.

Frequently after detoxication Morat observed a marked desquamation of the skin, principally on the forearms, hands, and legs. This is usually flaky but may occur in large strips. The nails during intoxication are dry and brittle and after withdrawal show definite transverse markings.

The teeth, always affected by the use of morphin, also suffer during detoxication.

The Sexual Apparatus. Although the sexual activity is inhibited as a rule in morphinists, the author has observed a number of cases where there was no alteration of the function. The same is true of the cessation of menstruation in women.[29]

---

[29] We would point out here that if Morat's explanations of the functional and organic changes he describes are correct, they would clarify certain reported phenomena and stimulate very interesting speculations as to others. The return of the leukocytes to normal and the eliminatory crises he describes should be valuable in guiding treatment and in determining when the patient may be expected to be released from constant observation. All of Morat's work might be profitably repeated and in some directions amplified. If his observations are correct, they would indicate the inadequacy of too brief treatments and of certain other commonly employed therapeutic procedures.

F. McK. Bell—1911.[30]

This author dwells more particularly on the psychic changes. He directs attention especially to the visions and hallucinations of the patient, his insomnia, ill-humor, despondency, transitory brilliancy, etc., inability for consecutive mental work and moral inertia; "he becomes untruthful, unreliable and unethical."

Physically, the author states, there is found fatty degeneration of the heart and liver in most cases, an anemia manifested by the ashy or leaden pallor, so well known. Nutrition suffers and the patients become thin and flabby, the pupils are small and react slowly to light. There is thirst and loss of appetite. He divides the effects into three states: First, "before the system becomes demoralized," the stage of exaltation; second, the stage of intoxication, when the physical and mental changes commence to manifest themselves, and third, the stage of cachexia with progressive weakness, emaciation, shrivelled, parchment-like skin, oedema of the extremities and nephritis. The disposition becomes morose and sullen and the patient is scarcely conscious of his environment.

A. A. Van Egmond—1911.[31]

In a study of the pulse frequency in chronic intoxication, van Egmond rendered tolerant a dog weighing 6.7 kg. by injecting 4 cg. morphin every two days. At the end of 16 days daily injections were given up to the 19th day. Van Egmond states:

> "After this time the same dose of morphin no longer exerted any narcotic effect on the dog. . . . During this whole period observations were made as to whether there took place a tolerance of the vagal center to the dosage used. For this purpose after an injection the pulse was taken at first every five minutes and then, if there appeared a constancy, every hour. During the first doses in the course of about 20 minutes the pulse dropped from 140 to 50 and then to 60 and 80 and remained at this point for several hours. On the slower pulses there was noted irregularity. This condition remained unchanged usually for seven to nine hours or at the most there was a slight acceleration of about 10 beats. After 24 hours, on the other hand, the slowing of the pulse had completely or nearly completely disappeared. On the appearance of tolerance this picture varied only slightly. The dog which no longer showed nausea or narcosis

---

[30] Bell, F. McK.—Morphinism and morphinomania. N.Y. M.J. 1911. XCIII. pp. 680-682.

[31] Van Egmond, A. A.—Uber die Wirkung des Morphins auf das Herz (zugleich ein Beitrag zur Frage der Morphingewöhnung). Arch. f. exp. Path. u. Pharm. 1911. Vol. 65. pp. 197-213.

reacted to every injection of morphin with a slowing of the pulse. In tolerant dogs the pulse action varied from the normal only by a very slight difference in duration. After 4 to 5 hours usually the pulse frequency increased. Also many times after one or two hours the pulse went back more quickly, if the dog which was no longer narcotized moved about the room. Also the degree of the slowing of the pulse appeared to be slighter after general tolerance set in, the number dropping between 80 and 100.

"Since it was not the object to produce a tolerance of the vagal center through the daily injection of a constant dose of 6 mg. per kilo, the doses were therefore increased. From November 5 to 10, 0.1 g., from November 11 to 25, 0.20-.5 g.; on November 30, the dose was 1. g. which was continued up to December 10. At the end of these experiments the dog weighed 4.4 kg. Therefore he finally reached a dosage of 0.23 g. per kilo.

"During this increasing tolerance from time to time there were days on which the dog returned to the old dosage of 6 mg. per kilo. At these times the pulse frequency was studied. Such examinations were made if there was complete tolerance at those doses so that the dog showed no vomiting, nausea or narcosis. The result was that the dog after complete tolerance to the subcutaneous injection of 1. g. morphin hydrochlorate reacted to an injection of the original dose of 4 cg. (1/25 of the tolerant dose showing no symptoms) with a slowing of the pulse from 120 to 80, which appeared within 25 minutes and lasted for 5 hours. The lower limit of the sensitiveness of the vagal center to morphin was determined: 1 mg. per kilo or 1/230 of the dose to which the dog was tolerant lowered the pulse frequency from 120 to 82 for a period of 2½ hours. A dose of 0.08 mg. per kilo on the other hand acted only weakly; the pulse dropped from 122 to 114. Since the minimal dose at which a slowing of the pulse appeared in normal dogs was found to be 0.04 mg. per kilo, these experiments show that in the highest grade of tolerance of the whole body to morphin the sensitiveness of its vagal center to this poison frequently remains the same. There is a slowing of the pulse on the administration of a small dose of morphin after as well as before tolerance is established; the final value for this action does not increase at all or at most only slightly. In any case a strong reaction of the vagal center lasting for hours may be produced by the injection of 1/230 of that dose to which the cerebral cortex and the vomiting center are completely tolerant. As pointed out above it is interesting to note that in intolerant animals the vomiting center reacts to practically the same small dose as the vagal center."

K. Schneider—1913.[32]

This author discusses the question of the etiologic relationship of addiction to the development of a psychosis in a case whose history he gives in detail. He states:

---

[32] Schneider, K.—Zur Frage der chronischen Morphinpsychose und des Zusammenhangs von Sinnestauschungen und Wahnideen. Ztschr. f. d. ges. Neurol. u. Psychiat. Originalen. 19, 1913. p. 25-42.

"While at least the acute form of cocain psychosis is undoubted, the possibility of producing psychoses is altogether absent in the case of morphin. Especially have the chronic morphin psychoses been abandoned by all the authorities. The earlier view taken of this was different. Thus A. Erlenmeyer, a student of morphinism from the very outset, was firmly convinced that chronic morphinism gives rise to psychoses with an absolutely bad prognosis. The majority of cases are incurable forms fitting in the picture of feeblemindedness. 'The most frequent form of intoxication psychosis is madness. Ideas of persecution and of grandeur, with or without hallucinations, form the disease-picture, whose existence betrays the psychical weakness.' Out of fifty histories detailed by him he described only a single case in which pure morphinism led to an incurable psychosis . . ."

* * * * *

"Here again it is very questionable whether we ought to regard morphinism as the cause of the psychosis; a combination with some disease belonging to the dementia precox group is far more probable in the light of general experience. It is certain that we do not know the features of a typical morphin psychosis, and so we always stand in doubt regarding diagnosis; as Jaspers also says, 'in a given case the causal association is free from objection only when there is a typical psychosis frequently observed as connected with the poison. In any other case there is a possibility of our having to deal with quite a different psychosis in a person chronically poisoned in a similar way.'

"Must a 'chronic morphin psychosis' always take the form of a combination? The following case will not settle this question but it is so deserving of attention and so full of problems and mysteries that a searching narration and discussion may prove very rewarding."

* * * * *

"Now let us ask ourselves what manner of disease did this patient have, in the course of which so singular a psychosis can find a clinical place?

"To summarize briefly: a man psychopathic from youth, who used morphin occasionally from his twenty-third year, habitually from his twenty-seventh, and drank heavily besides, began to hear voices about his twenty-eighth year and to develop delusions, particularly those of a jealous nature. The voices were heard in his deaf right ear, in which rustling and music had previously been frequently heard. Breaking off both poisons produced no improvement; on the contrary, a very strange paranoid condition developed, having sensory illusions in all fields, particularly hearing, and this lasted till his thirty-sixth year. Then very suddenly all his ideas of grandeur and persecution ceased, complete insight regarding his disease was gained, and after six years' residence in the asylum the patient was discharged as practically cured and capable of resuming his occupation. But the sensory illusions remain almost unchanged, although they are no longer misinterpreted. Since his discharge the patient has become nearly as pronounced an addict again to morphin and heroin, and now presents nothing beyond the ordinary picture of a morphin addict, incapable of work, without energy, tormented by all sorts of neurasthenic complaints, degraded in his finer ethical feelings.

"The first point that attracts our attention is the coincidence of the psychosis with the development of a difficulty in hearing causing unilateral deafness . . ."

* * * * *

". . . Even if we assume as a basis an individuality markedly psychopathic and manifestly paranoid, this psychosis, which moreover exhibits illusions of all the senses, is not susceptible of explanation as due to the ear disease.

"If we exclude this possibility, only two others are left, so that all diagnostic considerations culminate in one question: is this an intoxication psychosis or a paranoid form of dementia precox complicated in its course and picture by intoxication? At the time the disease began undoubtedly Dr. N. had used much alcohol and morphin, assuredly also some cocain. In its beginning, with voices and delusions of jealous import and with the violent conduct resulting, the psychosis reminds one strongly of the delusions of alcohol or cocain. In the further course of a cocain psychosis it is natural to think at most of the paresthesia that accompanies it and the illusive conceptions they lead to, but of nothing further, and moreover after all Dr. N. took so little cocain that it does not seem credible this can be the origin of the entire psychosis. Alcohol would seem more probable, but even in the most carefully studied alcohol psychoses such an event has never been observed. The many systemic aspects, the long continuance of the psychosis with complete abstinence without the occurrence of alcoholic degeneration, the ten years of hallucinations in spite of continued insight, the remarkable character and purport of the actual delusions of hearing, the absence, to all appearance constant, of any signs of delirium, of any condition of clouded intellect, the lack of any alcoholic element in the personality of Dr. N. make the supposition of a paranoid alcohol psychosis likewise hard to entertain.

"Can morphin be the still operative source of injury, the cause of the psychosis? We have seen that the existence of chronic morphin psychoses is even more doubtful than that of chronic cocain psychosis. Even if we should grant that the cases of chronic morphin psychosis observed by Erlenmeyer did not rest on delusion, still we cannot bring his cases into accord with the case of Dr. N. He lays stress on the unfavorable prognosis (in contrast with the abstinence psychoses of morphinism) and the termination in incurable feeblemindedness. Also the circumstance that the renewed morphin intoxication does not cause the psychosis to light up again undoubtedly adds difficulty to the view of morphin as an etiological factor. It certainly cannot be a typical instance of disease, experience argues against its being a morphin psychosis, but in the life of Dr. N. morphinism and psychoses of atypical forms so completely dominate the picture that the possibility of a causal relation cannot be entirely excluded.

"Or does a combination of intoxication and dementia precox exist, like that in Gräter's cases? Had not insight into the disease, complete correction of all illusory ideas been attained, there would be no doubt of such a combination, morphinism and dementia precox would be looked upon as independent children of a common degenerative origin. The nature of the sensory illusions, the thinking aloud, the senseless perversion of spoken words, the ideas of bodily influence, the strange sequence with its manifold physical content, the negativistic conception contrary to circumstances, the retirement within himself—these symptoms completely justified the diagnosis of 'chronic paranoia' before the termination was known. Certainly there resulted no dissolution of personality, impairment of will-power was not observed, and the affective life remained undiminished. If it is beyond question that Dr. N. is defective in personality, and especially shows a degree of indolence and dulness in his reaction to this process, still it would be doing violence in the matter to see in his condition a schizophrenic defective state, that is absence of any mania, absence of any intimation of peculiarity and eccentricity, and the good-natured dulness does not exceed what is observed in other instances after years' use of morphin. There is no evidence of impaired personality in the form of dementia precox. But yet this psychosis does not conform to the type recently described by Kräpelin as paraphrenia, which occasionally develops in chronic alcoholic intoxication and which does little harm to the internal relationships of personality, giving rise to no clearly marked disturbances of disposition and will. Only the classical manifestations come up for consideration, but one of the principal symptoms is totally absent, the secondary occurrence of sensory delusions often appearing years after the onset of the disease. But what positively rules out the diagnosis both of dementia precox and of paraphrenia, even if a defective condition of this sort is admitted to exist in Dr. N., is the complete rectification of the delusions, the self-criticism and the insight into his disease, the undoubted recovery from the 'madness' notwithstanding the sensory illusions remained. This ending certainly suggests rather an intoxication psychosis, although his remaining well in spite of renewed intoxication is out of accord with the supposition.

"Thus we are in no position to make a positive diagnosis. Perhaps the most probable solution, if the vague pseudo-diagnosis of 'degenerative insanity' is held unsatisfactory, is the view that the use of morphin (combined, it may be, with alcohol and cocain) is the foundation of the superstructure of pronounced degeneration as the cause of this singular psychosis. In medical diagnosis throughout a determined effort is made in every instance to correlate all the symptoms. Are we not too radical in our dealing with chronic morphin psychosis? May not some cases possibly have been overlooked because of the preconceived belief in their impossibility? Assuredly care is needed in admitting of 'combined psychoses,' for this will lead in the end to absolute nihilism, to irretrievable disintegration, to abandonment of all system."

G. E. Pettey—1913.[33]

Pettey attributes the psychic changes in cases of chronic opium intoxication to causes other than the drug, as will be seen from the following extracts:

"There are very few drug users who have not made many and often very desperate efforts to extricate themselves from the thraldom of the drug, or who have not, by some circumstances or other, been deprived of their drug supply. These efforts at abandonment or periods of deprivation have brought upon them the sufferings incident to the disuse of the drug, and these have proved to be so excruciating and intolerable as thoroughly to convince them that the voluntary abandonment of the drug is entirely out of their power; that what they once blamed others for not doing, they are themselves unable to do.

---

[33] Pettey, G. E.—Narcotic drug diseases and allied ailments. Tenn. J. A. Davis Co. 1913.

"While such experience may have worked a radical change in their own opinions, they are well aware that public opinion—the irresistible moral force—has not undergone any such change. They are acutely, or possibly morbidly, sensitive to that fact, but they are not changed in their purposes in life, in their desire to have and retain the respect and confidence of their friends and the public in general.

"They still love life, and their good name is as dear to them as ever They feel confident of their own integrity and good purposes, but they know that the drug has become a necessity to them. They also know that if their use of the drug should become known the blighting sting of public opinion would lacerate their very souls; therefore, in order to shield themselves from criticism and censure, springing from what they now know to be misguided public opinion, they procure their drug and use it in secret.

"Thus they start out leading a double life, a life of deception, with a skeleton in the closet that must be kept constantly concealed from public gaze, but the motives which prompt them to that course are not dishonorable.

"Self-preservation is said to be the first law of nature. A man is justified under the law in taking the life of his fellow-man when necessary to preserve his own, and in the protection of his good name, which to a right-thinking man is as dear as his life, very great liberty of action is allowed.

"The acts that are held to be a perversion of character, manifested by many of these persons, are not due to the physiological effects of opium, or to any pathological condition induced by it. The use of this drug does not, of itself, beget degeneracy. This springs largely, if not altogether, from another source. This is clearly shown from the fact that drug users who are independent of such influences maintain their integrity, sustain their good name, and retain the respect and confidence of their associates."

* * * * *

"In studying the history of a large number of patients who were unquestionably of good character prior to the formation of the addiction, the author has found that the perverse traits of character were prominent or not just in proportion as the other influences herein mentioned were prominent or not.

"If the addiction was formed by one who was entirely independent and could secure and use the drug without being interfered with by anyone, he retained his integrity, his business and social standing, etc., to a fair degree, but when the habitue was dependent on some one else for his drug supply, and this one a person who did not understand the necessities of his condition, or when his family or friends, or those to whom he was subject, undertook to break the "habit" by withholding the drug supply or the means of obtaining it, or when adverse fortune made it necessary for the drug user to resort to deception and other such means to procure the drug, the perverse traits of character were very prominent.

"These perverse traits were present in proportion to the length of time and the degree of intrigue and deception the drug user had been forced to use."

* * * * *

"No greater mistake was ever made by well-meaning persons than to attempt to deprive of his drug supply one who is addicted to the use of morphine. Such efforts only serve to drive the drug user to secret and often immoral acts to procure his supply.

"The only proper and reasonable course is to recognize the condition as a misfortune—a disease, as it really is, and one which cannot be overcome by merely depriving the patient of the drug. It should also be borne in mind that it is a really hazardous proceeding to deprive a drug user of his drug supply, since dementia or death may be the result."

* * * * *

"As a result of attributing the perverse traits of character manifested by some morphine users to the effects of the drug, both the profession and the public have fallen into the error of looking upon all opium users as of the same class, and since the comparatively small number of perverts among them are the ones who have become most commonly known, they have made the reputation by which all are judged.

"Such a conclusion is erroneous, and the opinion based upon it is manifestly unjust. Drug users differ from each other as greatly as do other people.

"Some of them retain their moral character, their veracity, and even their reputation without blemish, while others become moral wrecks; but it is evident that other influences besides the effects of the drug are potent factors in bringing about that wreckage."

F. Reach—1914.[34]

Reach studied the effect of the chronic administration of morphin on the intestine of a dog by means of the Roentgen ray. He found that

" . . . on continued administration of . . . morphin . . . there occurred a lessening of the inhibition of gastro-intestinal peristalsis without, however, reaching normal. On an increase in the dose the whole cycle was repeated. Withdrawal symptoms were not observed in relation to the gastro-intestinal tract, but were marked in connection with salivation. Finally it should be noted that without tation without blemish, while others become moral wrecks; but it is evident that the chronic effect of morphin are given with the reservation that there were involved only one animal and covered a period of injections of only ten weeks."

---

[34] Reach, F.—Zur Kenntnis der chronischen Morphinwirkung. Ztschr. f. exper. Path. u. Therap. 1914. Vol. 16. p. 321-326.

H. Dominick—1914.[35]

"The author reports on two morphinists in whom psychical phenomena were observed during withdrawal.

"In the first case the clinical picture of hysteria could be traced to a psychopathological constitution.

"In the second case a true psychosis was observed. After the patient in the beginning had withstood the withdrawal well enough, there appeared in the eighth to ninth week a state of increased depression and restlessness. The patient became unreasonable, noticeably disoriented and ended in a state of delirium. After about a week the mental condition returned to normal, the whole condition of the patient improved, while the spirits remained labile for a long period. Seven or eight weeks later a considerable improvement was observed."

K. Van Dongen—1915.[36]

This author reviews the work of van Egmond on the ability of the various nervous centres to become tolerant to morphin and undertakes to continue the investigation in relation to the respiratory centre and the pupil in dogs and rabbits.

Van Dongen used two dogs, weighing 9 kg. and 8.5 kg. respectively. First he studied the behavior of the respiratory centre and found the greatest inactive dose for the normal dog to be 1/20 mg. per kilo; the smallest active dose to be 1/10 mg. per kilo. Starting with a dose of 10 mg. per kilo, the dogs were rendered tolerant within a period of about 2½ months at the end of which time they were receiving 200 mg. per kilo.

During the gradual development of tolerance the respiratory reaction varied; just as the narcotic effect gradually became less and of shorter duration, the slowing of the respiration and the subsequent acceleration subsided and both ran a shorter course.

Van Dongen describes the behavior of the pupil as follows:

"The minimal active dose in intolerant dogs is 1 mg. per kilo; there is no noticeable effect on the pupil at ½ mg. per kilo. In both dogs the pupil was dilated and did not react to light. . . . As soon as tolerance to a given dose appeared, the degree of the mydriasis decreased and gradually the reaction to light followed. This (central) tolerance of the pupil appeared quite rapidly, more rapidly than the tolerance of the brain cortex (narcosis) and of the respiratory center. If the dose was increased there appeared again a mydriasis and a lessened reaction to light, which soon again decreased, etc."

---

[35] Dominick, H.—Uber Morphiumentziehung und die ihrem Verlauf vorkommenden Psychosen. Inaug. Dissert. Kiel, 1914. (We were unable to secure the original dissertation. The above quotation is a translation of an abstract by K. Boas in Neur. Centralblatt. 1915. Vol. 34. p. 943.)

[36] Van Dongen, K.—Beitrage zur Frage der Morphingewöhnung. Arch. f. Physiologie. 1915. Vol. 162. p. 54-66.

From his experiments on the rabbits, Van Dongen concluded that the continued reaction of the respiratory centre to the morphin demonstrated the inability of the rabbit to become tolerant.

J. Biberfeld—1915.[37]

This author reports in a series of articles studies made from 1915-1921 on the variations in the amount of lipoid in morphin-tolerant dogs, the specificity of morphinism, tolerance to codein derivatives and experimental detoxication.

In the first study, the author investigated the effect of morphin on the brain lipoids, in an attempt to determine quantitatively the variations in the amount of lipoid in morphin tolerance. For this purpose he employed four dogs which he had rendered tolerant to morphin, using normal brains for controls.

He concludes—

> "that the brain of a dog which tolerates, let us say 2.5 g. morphin—about ten times the fatal dose—shows no quantitative variation in its lipoid content. This may demonstrate, on the one hand, that these chemical components play no important role in the action of the alkaloid, and on the other hand, again, it shows how obstinately the brain protects its chemical constituents while under pathologic influences."

Henry Beates, Jr.—1916.[38]

Beates explains the psychical alterations as follows:

> "Tissues endowed with the higher functions of man, such as the brain, heart, etc., respond to most trivial exciting influences. . . . Conduct, therefore, is largely determined by the inherent sensitiveness of individuals. . . . It is because of this susceptibility that the highly organized and sensitive intellectual characters are prone to the narcotic habit. Men of action, achievement and progress feel the wear and tear of responsibility. They experience mental pain, an actual agony, and because narcotics blunt the sensorium we find them used for evident reasons. . . . By such types of brains too frequently is the law of habit regarded as escapable. . . . Habit is the unescapable consequence of repetition. . . . Everybody should be taught that no narcotic can be used even once, and

---

[37] Biberfeld, J.—Uber die Mengenverhältnisse der Hirnlipoide morphingewöhnter Hunde. Biochem. Ztschr. 1915. Vol. 70. pp. 158-163.

[38] Beates, Henry, Jr.—A brief Consideration of some mental characteristics of the Narcotic Habitué and a Suggestion for a Feature in Management. Interstate Med. Jour. 1916. 23. pp. 437-444.

the equilibrium existing between the emotional, intellectual and volitional not be, at first, seriously disturbed. . . . Thus step by step the deluded and ambitious leader grapples with responsibilities and . . . by this time the poisonous properties of the drug have blunted, the intellectual. The moral is now included and a character noted for integrity and reliability becomes weak and indifferent."

C. L. Dana—1918.[39]

"Most addicts are constitutionally unstable persons, likely to be a burden or a menace to society anyway.

"Drug addiction does not lead to insanity or the serious psychoses needing custodial care. The percentage of such cases in State hospitals is very small. It is very large, however, in prisons and reformatories and it would seem as if drug addiction had more relations to crime and social waste than to psychiatry.

"The drug addict is not usually a mental defective, and a series of intelligence tests would not disclose large percentages of morons and imbeciles, as happens in certain other anti-social groups."

W. Hale White—1918.[40]

"Morphine for the most part circulates in the blood as such, and is excreted almost entirely by the intestinal mucous membrane, and very slightly by the kidneys, but a small part of it is destroyed in the body, probably in the liver; if morphine is taken habitually, the amount so destroyed gradually increases, and this explains why some persons can take such large quantities. The fate of the other alkaloids is not known, nor are we aware of any direct action of any of the constituents of opium on the blood itself.

"The higher faculties are at first excited by small doses. In a few persons there is no incoordination in this excitement. The intellectual power and mental vigour are increased, and therefore the drug is taken by some people to enable them to do their mental work. Usually, however, the excitation does not affect the mind evenly; generally the imagination is powerfully and pleasantly excited, much more so than the faculties of reason and judgment, which are a little dulled. The expression on the face is one of happiness and comfort, and this corresponds with the condition of mind, which is in a state of peace, calm, and happiness. This is soon succeeded by sleep, which is accompanied by pleasant dreams, generally of an impossible nature. With some persons, however, the sleep is quite dreamless. This, which is the beginning of the depression of the highest centres, is soon followed by depression of the others, the higher being influenced before the lower, so that soon the sleeper does not respond to any sound, light, or cutaneous stimulation, nor does he feel pain."

---

[39] Dana, C. L.—Problems of Drug Addiction. Med. Rec. Feb. 2, 1918.

[40] White, W. Hale—Materia Medica; Pharmacy; Pharmacology and Therapeutics. London. 1918.

M. C. Mackin—1919.[41]

"The mental symptoms of morphinism, as defined by Dr. Lentz, who tabulated what he considers the most prominent changes in morphinism, are:

"First, diminished power of recollection, increasing amnesia or disability to recall past mental images and ideas.

"Second, diminished power of attention and volition.

"Third, diminished power of initiativeness and energy of conduct.

"Fourth, diminished muscular power, frequently marked by trembling.

"Fifth, blunting of the higher moral and ethical senses.

"Sixth, insomnia, loss of desire for sleep, and nutritive disturbances of the whole cortical sphere.

"These divisions undoubtedly describe the conditions which occur more or less prominently in every case and there are very few cases that escape special sense involvement. One cannot use morphin long without suffering from weakened, obscured ideas of duty and right relations to others; conceptions of truth and discriminations between truth and falsehood become more and more cloudy; egotism, selfishness, childish prevarication, are quite marked in the majority of cases; a decreasing sense of honor, less pride in character and appearance follow; forgetfulness to carry out promises, suspicion of wrong from others, with delusions that they can conceal their condition and deceive friends and associates is an ordinary accompaniment of morphinism. A man previously truthful and honest who suddenly falsifies and does disreputable things without apparent motive may be expected to be under the influence of some powerful drug."

A. C. Buckley—1920.[42]

"Mentally there is a characteristic sluggishness, which disappears transitorily following each dose of morphine. As a rule, the patient loses interest in his accustomed pursuits, family and friends and seems generally indifferent towards everything but himself. Emotionally he is irritable when not indifferent. His judgment and consequently his idea of proportion are notably lacking. All sense of responsibility and regard for truth disappear; he will resort to all sorts of devices and sacrifice self-respect in order to obtain his desired drug. Insomnia and restlessness are persistent except while the patient is under the influence of morphine."

James M. Anders and John H. Musser—1920.[43]

"In cases of death from acute or chronic opium or morphine poisoning there is nothing distinctive in the pathologic appearances. In acute cases vascular congestion of the brain and membranes has been noted; but even in chronic cases the tissue degeneration and fatty and connective-tissue proliferations that are characteristic of alcoholism, are practically absent. Decided lesions are usually traceable to associated affections. The principal anatomic changes are those due simply to malnutrition. Thus, we have the emaciation and the shrunken appearance of cerebral anemia, the pallor and atrophy of the cardiac muscle and of the vascular walls. The dried and wasted structures, due to tissue starvation, are quite a contrast to the fat-infiltrated or degenerated, cirrhotic, and inflamed tissue of alcoholic inebriety. Direct destruction of parenchymatous cells is more evident in the latter.

---

[41] Mackin, M. C.—Morphine addiction. Bull. Iowa Inst. 1919. XXI. pp. 171-176.

[42] Buckley, A. C.—Basis of Psychiatry. 1920.

[43] Anders, J. M. and J. H. Musser—Practice of Medicine. 1920.

"These may be in abeyance for some time, while the habit is forming and the doses are still slight. As the craving increases, the dose and its frequency increase to keep pace with the desire. Anemia gradually develops, with sallowness of the skin, wasting of the features and body, languor, weakness, functional deterioration, mental depression, anorexia, restlessness, insomnia, tremors, irritability, shyness, dilatation of the pupils (except when under the influence of the drug), and a characteristic propensity to lying. Cardialgia is often complained of by those who use opium pretty constantly. The associated vices of opiumism are less violent and inflammatory than those of alcoholism, and more secretive and speculative, such as gambling and sexual perversions. Itching is frequent, and especially after taking the opium or morphine. Attacks of chills, followed by pyrexia, with delirium and transient albuminuria (renal congestion) occur in some cases. Diarrhoea and dysentery have been observed in some instances. There may be also disturbances of the visual muscular apparatus. Sufferers from painful carcinoma in whom opium or morphine is required for steady use do not become, except in rare cases, true morphinomaniacs."

E. S. Bishop—1920.[44]

"It is my opinion that, however much increased oxidation aids in the handling of morphine, it is to the formation of an antitoxic substance that we look for the explanation of our clinical manifestations and for the classification of morphine-addiction, as a definite medical entity. This opinion is based on certain clinical manifestations of morphine effect and the symptomatology attending insufficient supply of morphine to those addicted, on certain phenomena observed during and following treatment, on the persistence of tolerance and on the susceptibility of the cured patient to the re-formation of addiction."

* * * * *

"What characteristic action exists in opiate or narcotic drugs which gives them this power to establish the above described mechanism? It seems to me, that it is, above all, their power to inhibit body function. They tend markedly to arrest metabolic processes. They inhibit glandular activity. They inhibit unstriped muscle activity and hence peristalsis. They, therefore, cause a slowing up of the glandular function and intestinal activity, and of elimination. This results in an accumulation of opiate in the body. It is this constant accumulation to which the body must become tolerant by the development of some mechanism for its protection.

"*Autointoxication and Autotoxicosis.*—It is to the element of inhibition of function also that we must look for explanation of what is by far the most important element in the immediate picture presented by most individual cases. I refer to autotoxicosis and to auto and intestinal toxemia. The same power that locks up within the body the opiate drug, locks up the toxic products of tissue activity and tissue waste, of intestinal poisons and of insufficient metabolism. Autotoxemia itself is markedly inhibitory in its action, and contributes no little to its own increase and to the further development of narcotic disease.

---

[44] Bishop, E. S.—The Narcotic Drug Problem. 1920.

"It is not at all impossible that any inhibiting poison, constantly present in the body, will some day be found to establish a mechanism of protection, similar to that of opiate addiction, and that some of the states now popularly and loosely classified under the general head of 'autointoxication' will be recognized as really addiction-states, in which the body has become progressively tolerant of its own poisons. I believe that it can be demonstrated that some of the phenomena and manifestations at times observed in chronically inhibited and autotoxic individuals in whom there can be no suspicion of any opiate or narcotic element, are analogous to the phenomena of narcotic addiction-mechanism. It is not inconceivable that any inhibiting poison or toxin is capable of producing its own addiction-mechanism, and it has seemed to me that my own clinical familiarity with the action and reaction of narcotic, inhibiting, or addiction-forming drugs and of addiction-mechanism upon circulation, glandular and intestinal and other function has been of no little assistance in the interpretation, control and remedy of other chronic intoxications.

Upon the extent of inhibition of function and autointoxication, therefore, depend some of the immediately predominating manifestations in individual cases. They must be reckoned with and eliminated in the measure of addiction-disease in the individual sufferer. In many cases they contribute the immediate and compelling indications for rational therapeutic endeavor. To a considerable extent they determine circulatory efficiency and metabolic and glandular activity and balance. They largely control physical tone and physical reaction. Inhibition and intestinal and autotoxemia cause most of the physical and mental deterioration, and much of the incidental symptomatology so widely ascribed directly to narcotic drug effect. Upon the extent of their presence, therefore, depends greatly the clinical picture in the individual case. This doubtless accounts for the acidosis, noted by Jennings and others, inasmuch as it has been definitely proved that acidosis is commonly present in all conditions of functional depression and exhaustion.

"With inhibition and auto and other toxemia eliminated or reduced to a minimum, the patient can go through many years, an apparently normal man, well-nourished reactive in good physical tone, mentally sane and physically competent. Under these conditions he shows practically nothing abnormal as long as he gets properly administered, his accustomed narcotic drug, in the amount of its minimum physical requirement or body-need. His condition is often unsuspected by those nearest and dearest to him, and the popularly held opinion that narcotic addiction shortens life does not seem to be upheld by the facts in his case. Such cases as his are far more numerous than has as yet been realized.

"In the types of narcotic addicts most widely recognized, inhibition of function and autointoxication is marked, and the opiate drug is used in excess of body-need. The addict of his description becomes a deteriorated wreck, requiring high doses of opiate for the satisfaction of abnormal body-need, mentally and physically incompetent—the generally accepted picture of the so-called 'dope-fiend' a deteriorated, degenerated, malnourished wretch, degraded, avoided and condemned.

"Inhibition of function and autointoxication should not be vague terms. They cause and are measurable by definite clinical evidence. They display manifest phenomena and symptoms, and become increasingly defined material entities, as the clinician looks for them as such. Much of inhibition of function and autointoxication and of their manifestations, has been recognized and taught under their own heading and in connection with conditions other than narcotic drug addiction-disease. That the influence and importance of inhibition of function and autointoxication in the development, and manifestations of the narcotic drug addict has escaped general and widespread recognition, is evidence of the small amount of unbiased clinical study, and of analytical clinical interpretation of material physical phenomena, hitherto accorded to narcotic drug cases.

"I would not have it concluded that all symptoms and manifestations arising in the handling of a drug addict are due to the factors and elements I have discussed in this chapter. It must be always in the mind of the intelligent and conscientious physician, that he has in his care a human being with the same medical and psychical possibilities that must be taken into careful and complete account, as in the handling of any other sick person. There is an unfortunate tendency to overlook concurrent, or complicating or pre-existing conditions in the handling of the narcotic drug addict. These cases are often extremely complex and difficult to analyze, and for adequate comprehension and handling of them, the symptoms and manifestations they show should be appreciated in their true origin and character as they occur in each individual case."

H. Kogerer—1920.[45]

Kogerer made some studies of allergic reactions in morphinists. He used Hecht's method of testing on 15 cases and came to the following conclusions:

"1. The majority of the chronic morphinists show a perceptible hyposensitiveness to intracutaneous injections of morphine solutions.

"2. Some of these patients show an increase in sensitiveness during abstinence.

"It may be possible to determine objectively in a stubborn patient the diagnosis, which once happened in one patient. But in the great majority of cases the diagnosis is possible without this means. Much more important is the question whether we can draw prognostic conclusions at the end of withdrawal on the return of a normal skin reaction, somewhat with the idea as to whether we might expect a relapse of the permanent hyposensitiveness, with greater probability than in the case of patients who are left with a normal reaction. This is not to be determined, however, within the short period of observation.

---

[45] Kogerer, H.—Erfahrungen uber die Hechtsche allergische Reaktion bei Morphinisten. Wien. Med. Wchnschr. 1920. LXX. 1045.

"3. It is possible to determine a probable relapse by a comparison of the state of the skin after withdrawal and later."

C. E. Sandoz—1922.[46]

"Although, through prolonged use, morphine becomes absolutely necessary for the comfort of the individual, this does not mean that it does him no harm. *On the contrary, it is a poison which, if taken over a long period in large doses which, severally, do not produce striking symptoms, brings about a condition of chronic intoxication. This manifests itself in changes both mental and physical.* The mental changes affect all three aspects of the mind: intellect, emotions, and will, especially the two latter. The memory becomes unreliable, particularly in regard to the sequence of events. Intellectual efficiency, above all that requiring initiative, decreases, but can be spurred on by morphine. The emotional tone shows marked ups and downs. Morphinists are now cheerful, hopeful, good-natured, now without ambition, irritable, arrogant, despondent. Despondency may be so marked that it leads to suicide. They become easily tired and will sometimes be overwhelmed by sudden drowsiness which makes them fall asleep in the middle of an occupation or conversation. They experience constant changes between times of relative well-being with relaxation and times of nervousness and restlessness. These changes are partly dependent upon whether the last dose of morphine is still acting sufficiently or not. This makes a regular and purposeful activity impossible and is one of the reasons why morphinists go down hill economically. But the main cause of this is perhaps the modification of their character. They become weak-willed, mentally 'flabby,' shirk any effort, exhibit oversensitiveness to pains and annoyances. They lose all sense of responsibility, neglect their duties and live from hand to mouth. The circle of their interest narrows until it is finally reduced to morphine and the means of obtaining it. In order to secure the drug they will, if necessary, lie, cheat, steal, or do anything. Even if a morphinist is otherwise trustworthy, to rely on his word or his actions in regard to morphine would be, and too often is, a fatal mistake. But lying, cheating and the like are often tendencies of morphinists in matters which have no connection with their habit and seem to be due to a loss or deterioration of moral feelings. However, concerning this latter point, there are divergencies of opinion among those who have had wide experience with morphinists. It is very possible that absence of ethical feelings in many cases is not a 'loss' due to morphine but a primary 'lack' which, in a large category of cases, is directly or indirectly at the root of morphinism.

"The most striking bodily changes in morphinism concern nutrition. The patients lose weight, often becoming emaciated, the tissues are flabby, the skin is pale and sallow, the hair is dry and falls out, the nails are brittle and the teeth have a tendency to decay. These disturbances of nutrition are probably partly caused by a deficient function of the stomach and intestines, due to the checking influence of morphine on the digestive processes. A stubborn constipation is generally present. The appetite is usually bad, especially for meat, their favorite diet being sweets and fruit. Among the other symptoms of morphinism we can mention the following: sleeplessness, palpitations of the heart, accompanied by a rapid and irregular pulse, fainting spells, disturbances of respiration, especially asthma. Profuse perspiration or the opposite, an extreme dryness of the skin, chilliness, all sorts of disagreeable sensations in the region of the heart, stomach, bladder and in the limbs. A symptom which is very frequent in inveterate cases is a decrease or loss of sexual desires, accompanied by impotence in men and loss of menstruation in women.

---

[46] Sandoz, C. E.—Report on Morphinism to the Municipal Court of Boston. Jour. Crim. Law and Criminol. May 1922.

"However, the symptoms of chronic intoxication are more or less marked according to the cases, the amount of morphine taken and the duration of the habit being the main factors in its severity. Individual disposition and other factors, such as the mode of life, also seem to play a great role. Certain morphinists apparently withstand remarkably well the effects of prolonged and intense use of morphine, while others are very sensitive to it. All degrees are found between those who are wrecks after a few months and those who, in spite of large doses, do not show striking changes after several years or even decades. So that, contrary to the current belief, *the appearance of a morphinist does not always betray his condition.* There are cases, even of long standing, in which a morphine addict looks well and does not, when satisfied with morphine, suggest drug addiction. It is true that, in most inveterate cases, morphinism is suggested by the looks, but, even then, these have nothing so characteristic about them that they can be differentiated at first sight from the appearance of numerous other people who look sickly for a different reason. *That which is characteristic of the morphine habitué are the changes which his condition and attitude undergo during the course of a day, according to whether he is in need of the drug or not.* After a 'shot' he will look and act at his best, but when the effect of the morphine wears off he begins to break down. If a new dose is then taken the crestfallen individual undergoes a sudden revival and feels and looks a different being. If not, clear-cut and distressing withdrawal symptoms gradually develop. In contradistinction with other poison, then, cocain and alcohol in particular, *it is not when under the influence of the drug that the morphinist looks very abnormal and is easily recognized; it is, on the contrary when he must go without it.*"

Paul Sollier—1923.[47] [48]

Sollier, 1894-1923, in a number of different articles has described certain pathologic findings and speculated concerning others whose existence he has had no opportunity to establish.

For the most part, however, he limits himself to a consideration of changes which occur during withdrawal and, therefore, we are presenting this material in the next chapter. However, the following abstracts of articles by Sollier dealing with certain pathologic changes are included at this point inasmuch as they refer to the condition during intoxication as well as detoxication:

---

[47] Sollier, P.—Récherches sur la viscosité sanguine dans l'intoxication morphinique. Bull de l'Acad. de Med. April 24, 1922. pp. 428-431.

[48] Sollier, P. and D. Morat—de l'Épreuve de l'Hémoclasie Digestive chez les Morphinomanes au cours de l'Intoxication et de la Désintoxication. Presse Med. January 10, 1923.

In the first article[47] Sollier reviews the hematologic changes reported by Morat and describes further studies on the viscosity of the blood at different stages of intoxication and detoxication, making the following observations:

During intoxication when generally a red cell increase exists, the viscosity of the total blood is increased.

This increase is due particularly to the red cell viscosity, the plasma viscosity remaining normal.

During withdrawal the total viscosity increases still more, still due to the effect of the red cell viscosity much more than to that of the plasma.

Fifteen or twenty days after the withdrawal, the viscosity approaches normal which it reaches in from the thirtieth to the fortieth day when it goes below that of the period of intoxication.

He reviews the findings in a case of heroin intoxication and explains the phenomenon as follows:

Realizing that during the periods of reduction and of withdrawal patients are subjected to repeated purgation and have very abundant urinary and other discharges through glandular hypersecretion, it was thought that this hyperviscosity was due to a dehydration of the organism. However, the figures show that the plasma viscosity varies only very little proportionately while the red cell viscosity increases considerably.

The variations in the increased red cell count do not seem, on the other hand, sufficient to explain the degree of increase in the total blood viscosity. Apparently an additional factor must be sought. This factor is no other, according to the opinion of the author, than the morphologic and structural changes which were noted at the time of withdrawal, the friction of the red cells being very much increased, because they are deformed and torn.

These facts, which accord in every way with earlier observations as to the red cell resistance and the changes in the blood picture during detoxication, he believes, show that the clinical phenomena of morphin withdrawal depend on organic causes, of an origin analogous to that of certain infectious maladies, and that the psychologic symptoms that are seen in abstinence are the result of real organic disturbances, and not, as some still claim, of a vicious mental habit.

We quote the following extract from correspondence with Dr. Sollier, in which he describes certain deviations from normal susceptibility to certain infections during chronic intoxication and after withdrawal:

> "During the period of intoxication, morphinists appear to escape infectious and epidemic diseases, grippe, pneumonia, colds. Their abscesses, although often very large, only occasionally take on phlegmonous characteristics. They contain only cocci and very rarely the ordinary pyogenic species (staphylococci or streptococci).
>
> "On the contrary after demorphinisation, sensitiveness to these maladies reappears.
>
> "A similar increase in sensitiveness is evidenced toward morphin after detoxication. Also in the case of early relapse, they are not able to reach their former doses and their decline is very much more rapid and marked than during the first intoxication."[49]

In his last article in collaboration with Morat,[50] Sollier discusses the digestive hemoclastic reaction, following Widal's technique as it occurs in chronic morphin poisoning and during detoxication.

They first review the profound effect on the liver function exercised by opium in chronic intoxication and the violent reaction that takes place in withdrawal as evidenced by the abundant production of bile, the diarrhoea, vomiting, presence of biliary pigments in the urine, etc.

It was these marked functional disturbances of the liver that stimulated their studies of the hemoclastic crisis in these cases. While certain phenomena usually present in this reaction were not observed—alteration in arterial tension, in coagulability and the viscosity of the blood—they did find a marked leukopenia during intoxication and also during detoxication after the injection of 200 g. of milk, though it ceased to develop between the twentieth and thirtieth day after the withdrawal of the drug. They give the details of two typical cases, one using morphin and the other heroin.

---

[49] A review of the preceding material leads us to speculate as to the advisability of withdrawing morphin from a chronic user during the course of an acute infectious malady, just prior to a surgical procedure or at any time when the individual is likely to be in need of all his ability to resist toxemias or shock. It has been claimed by some that influenza, pneumonia, and certain other infections are not so well withstood by chronic users of opium when the drug has been recently withdrawn as when these cases are permitted to remain on a "balanced ration" until recovery from the intercurrent infection is complete. It is also claimed that for the same reason it is advisable to clear up surgical conditions before the withdrawal of the drug. To do so at least would lessen the psychic tendency to relapse from the pain and depression consequent upon operations or illnesses which may closely follow withdrawal. These would appear to be practical points in the handling of these cases which, because of their possible importance in treatment and prognosis as well as in the prevention of relapse, require further observation and study.

[50] Loc. cit.

They also found that the leukopenia occurred after injections of the customary drug in either the usual large doses or in minute doses and also upon the administration of drugs of the veronal series.

They come to the following tentative conclusions:

"1. Morphinists and cases of other chronic poisoning in whom the function of the liver is distinctly affected by the poisoning alone, present after taking 200 cc. of milk a hemoclastic crisis characterized by a marked leukopenia.

"2. This crisis persists for a certain length of time after the withdrawal and does not disappear until between the twentieth and thirtieth day after the suppression of the morphin. The disappearance of the hemoclastic crisis in detoxication is a very certain index of good progress in the convalescence of the patient. It agrees further with other manifestations which we have pointed out as indicating the return of the normal functioning of the organism, with which it occurs simultaneously.

"3. These cases also show a definite leukopenia at the time of the injection of the morphin but this leukopenia bears no relationship to the amount injected because an infinitesimal dose in a morphinist accustomed to large doses causes the same leukopenic reaction.

"This explains how during total abstinence an infinitesimal dose as compared with the usual dose is sufficient to allay and arrest violent and painful reactions. It also explains how, in a morphinist from whom the drug has recently been withdrawn, a small dose of morphin is sufficient to set up in his organism a state which reawakens at once his dependence and creates a need which leads him to relapse. Therefore, we advise expressly never to give, *even a long time after withdrawal, for any reason whatsoever in any form or in any dose,* opium or above all morphin to a former chronic user.

"4. Hypnotics, always very harmful when they are added to morphin intoxication, cause when taken by a morphinist or even by a morphinist after detoxication the same hemoclastic phenomena which milk and morphin cause. Hence it should be the rule never to combine during the course of morphin intoxication or to give as a substitute during detoxication narcotic or stupefying drugs of any kind."

M. Horiuchi—1923.[51]

The following brief abstract gives the author's findings on the effects of experimental chronic morphin poisoning on the suprarenals of tolerant rabbits:

---

[51] Horiuchi, M.—Ueber die Befunde der Nebenniere bei experimenteller Morphiumvergiftung. Trans. Japan Path. Soc. Tokyo. 1923. Vol. 13, p. 47.

> "The pathological anatomy of chronic morphin poisoning, which is so widespread in China, has not yet been completely explained. The author gave rabbits daily a certain quantity of morphium hydrochloricum solution through subcutaneous injection. The animals showed distinct hyperglycemia and glycosuria and fell into a deep sleep for several hours. But gradually they became addicted to the initial dose of morphin, so that the dose was continually increased until the animals finally died of cachexia. Dissection revealed hypertrophy of the adrenals. The cortical layer was histologically expanded and the medullary cells were augmented in size and number. The chromium reaction of the medullary cells was not especially pronounced in comparison with control animals. It was, however, highly pronounced in animals in which several days had intervened between the dissection and the last morphin injection. In the author's opinion the hyperplasia of the cortex is to be understood as an active, appropriate adaptation of the organism against the hyperglycemia, because the adrenal cortex as well as the *Langerhans* islands of the pancreas act as a check against sugar metabolism. With regard to the hyperplasia of the medulla the author conjectures that morphin stimulates the sympathetic nerves, which would lead to the hypersecretion of adrenalin and, consequently, to the hyperactivity of the medullary cells."

Adolf F. Hecht—1923.[52]

The author states that Philippson was the first to produce urticaria in dogs by injecting morphin beneath the skin. He also reviews briefly the work of Török and Vari, Jadassohn and L. Rothe and that of Alice Stauber-Lehndorff, all of whom produced allergic reactions in the skin with morphin injections.

In his own experiments Hecht undertook first to study the disappearance of the reaction change after a single injection, and made observations on the reaction occurring on the intradermic injection of atropin and the possible relationship between sensitiveness to morphin and that to atropin. He then studied these reactions in addicted individuals before, during and after the withdrawal of the drug. After reporting his findings in detail he continues as follows:

> "The results in studying morphin habitués are not reliable because, in the first place, the degree of sensitiveness before using morphin is unknown; further, the very cachexia attending severe morphinism may produce anergy; and finally the statements of patients respecting their behavior outside the institution are to be regarded with skepticism.
>
> "But prolonged abuse of morphin considerably diminishes sensitiveness to

---

[52] Hecht, Adolf F.—Pharmakodynamische Untersuchungen an der lebenden Haut. V. Die Allergie der menschlichen Haut gegenüber primären Giften und die Morphinempfindlichkeit nach Morphingebrauch. Ztschr. f. g. exp. Med. 1923. Vol. 38. pp. 123-130.

morphin (cases 1, 5, 8), often in part, only the exudation (case 6) or only the erythema (case 9) being encountered. Cachexia alone was not sufficient evidence in case 4 of hyposensitiveness to morphin, for the equally cachectic case 2 had normal sensitiveness to morphin. The phenomena during withdrawal and after it are not reliable.

"Sensitiveness to atropin, evidenced nine times in sixteen cases, seems generally to be diminished, even when sensitiveness to morphin is normal, as in cases 2, 3, and 7. In case 10 the impression is received of a relatively higher sensitiveness to atropin and lower to morphin, and in case 2 the atropin reaction is constantly much more pronounced than in case 3, although both alike react forcibly and normally to morphin.

"No similarity exists between atropin and morphin in this respect, as might be expected from the contrasting behavior of the two substances after a single injection of morphin.

"The commonly observed allergy of the skin on the part of morphin habitués may, therefore, be due to a specific alteration of the skin, at least in the main, and this seems to me important in explaining morphin addiction.

Summary.

"1. A single injection of two centigrams of morphin altered the sensitiveness of the skin to morphin by causing it to diminish and later to increase. Its sensitiveness to atropin withstood alteration.

"2. A single injection of one milligram of atropin increased the sensitiveness to atropin, to be sure, but left morphin sensitiveness unchanged at the height of its effect.

"3. Abuse of morphin diminishes the sensitiveness of the skin to morphin. Conclusions are not reliable in the period of withdrawal.

"4. Allergy of the skin to morphin throws light on the cause of morphin addiction (cell changes in part at least on a specific foundation)."

Erich David—1924.[53]

"The most prominent characteristic we find in the somatic disturbances of the first stage, the period of addiction, is depression of the whole biotonus. Very striking are the inhibition throughout the gastrointestinal canal and the complete inhibition of glandular secretion. Hence occur loss of appetite, constipation, diminution of urine, and impotence. These are all manifestations of increased sympathicotonus and of diminished parasympathicotonus. Increased sympathetic activity is evident also in distension of the bronchioles, in vasoconstriction, in raised body temperature, and in trophic changes in the skin, teeth, and nails. Still further noticeable is the augmented thirst which is a result of retention in the blood of crystalloid bodies and may likewise be traced to increased sympathetic action. On the other hand, it cannot be denied that the pupillary contraction and slowing of cardiac action are consequences of increased parasympathicotonus. All in all we have a depression of the entire biotonus and consequently as a rule enormous loss of weight. Thus the first stage is chiefly noticeable for increased sympathicotonus and decreased parasympathicotonus, but, as already shown, there are exceptions. It cannot be said positively that morphin acts selectively on either of the two systems. Furthermore, in case of some symptoms it is very difficult to tell whether sympathetic or parasympathetic excitation exists. The construction of the human organism is much too complicated for that. In the midbrain, besides the principal centres, we find certain other subordinate centres, and we recognize in addition numberless reflex arcs, partly in the brain, partly in the spinal cord, it may be traversing the whole periphery (the intramural system). We know well also how all the organs have a mutual influence on one another. I shall cite only one example. Wuth instances vesical spasm as a result of increased vagotonus. But this is not correct. For experimental excitation of the hypogastric plexus causes increase of sphincter tonus and diminution of detrusor tonus with retention of urine, while excitation of the pelvic nerve occasions relaxation of the sphincter vesicae and contraction of the detrusor with consequent expulsion of urine. Therefore in vesical spasm we are dealing with a purely sympathetic excitation. Corresponding with this, increased sympathetic activity also produces contraction of the pyloric sphincter, of the ileocolic sphincter, and of the internal anal sphincter, phenomena also observed in fact in morphin addiction. In all probability the condition in these last named instances is that of an intramural reflex.

---

[53] David, E.—Uber Morphinismus. Ztschr. f. d. g. Neurol. u. Psychiat. 1924. Vol. 89. pp. 613-617.

"From all this it may be confidently asserted that, during the period of addiction, morphin acts chiefly as a stimulant to the sympathetic and an inhibitant to the parasympathetic. When Wuth reaches the opposite result the interpretation of his results is a matter, as he himself says, only of pharmacological analysis, not of studying addiction.

"The second stage, that of the acute symptoms of withdrawal, is marked by a complete revolution in the nervous system. It is very difficult to steer a course through the mass of phenomena. Increased parasympathetic effects alternate with increased sympathicotonus. While, in the first stage, parasympathetic diminution endeavors to counterbalance increased sympathetic action, now the impression is given that the parasympathetic preponderates greatly, while the sympathetic is unable with its diminished tonus to restore the lost balance. Sensations of heat and cold alternate, uncontrollable vomiting takes place, profuse diarrhoea, unprovoked perspiration, attacks of yawning and sneezing, unmanageable cardiac palpitation, polyuria, salivation dominate the picture.

"This stage passes gradually into the third, where we can trace indubitably the influence of a quickened parasympathetic and a depressed sympathetic. Polyphagia, priapism, sweating, diarrhoea, polyuria, reddened skin may be observed, also rapid heart action and enlarged pupils, both phenomena which, as in the first stage, indicate an excited sympathetic. On the whole, however, a decided preponderance of the parasympathetic. The whole organism seems exalted, hence a prodigious increase in weight.

"So we summarize:

"In stage 1 increased sympathetic and diminished parasympathetic.

"In stage 2 sympathetic and parasympathetic indifferently.

"In stage 3 increased parasympathetic and diminished sympathetic.

"Let us pass now to manifestations in the psychic field.

"We endeavor in these days with Kretschner to take constantly into account the numerous factors which may enable us to explain the complete picture of a psychic disorder; in addition, for instance, to the constitutional cause, we should inquire into the character make-up, a possibly influencing event, the environment as respects internal secretions and infection, as well as any exhausting influences. Thus the psychic picture connected with morphinism also differs widely in different individuals. Invariably the kernel can be extracted from the complex of manifestations which bears a relationship to the changes of the general organism in the three different stages.

"Thus the diminution of organic tone in the first stage is accompanied by a depression of vital sensibility. The frame of mind is usually melancholic. The world seems colorless, hostile, every interest palls, no pleasure is taken in anything and the victim avoids human society altogether. Every event is taken more tragically than under normal conditions, the future appears black, all pleasure is gone from the present and finally come indifference to life, suicidal thoughts. Association of ideas is limited, there are long lapses in thought, thinking is onerous. The attention remains concentrated on one idea without being diverted. Within this idea too the attention is very vascillating. Thus a diminution occurs of keenness of attention. Working capacity rapidly diminishes and the will becomes very weak. Initiative is lost, effort becomes difficult and slow, the bearing slouchy, and the patient lies around for hours without occupation. As regards plasticity of the dream fancies and the supposed euphoria so obtained, this is always manifested with special certainty after fresh administration of morphin and is probably the result of stimulating the nerve cells. Furthermore, this phenomenon becomes less prominent as addiction advances.

"After all, there is in this stage a close similarity to the melancholic phase of manic depressive insanity, as would be expected from the sluggishness of the whole organism.

"In the second stage the mental picture remains melancholic. On the other hand, the sluggish thinking of the first stage is replaced by a normal flow of ideas. Ideas flow incessantly through the head; the consciousness of not being able to control them and think them out is very annoying. Ability to concentrate is greatly reduced; the simplest reading or conversation fails to hold the attention. A vast unrest seems to be a most painful experience, and patients move about without finding rest day or night.

"I need only call attention to the great similarity of this condition to manic depressive mixed states.

"The third stage sometimes begins with increase of body weight. The world appears all at once in a wholly different light, joy is renewed in life, in nature,—in fact in all in which before no interest was felt. The frame of mind is prevailingly euphoric, but vacillating. Self-consciousness is exalted, the mental instability continues for a long time, weeks after even the patient is still incapable of work, uncontrolled and without power of concentration. Here there is a striking resemblance to the manic phase of manic depressive insanity.

"Wuth has called attention to the great similarity existing between our second stage and Basedow's disease.

"The vegetative midbrain centre naturally affects the entire endocrine system, and it is to be expected that disturbances in the latter will also cause disturbances in the ganglia at the base of the midbrain. The question whether morphin primarily affects the vegetative centres or the endocrine system in my view does not admit of a positive decision at present.

"I only will say in addition that, just as in Basedow's disease, a striking resemblance exists also between our second stage and Freud's anxiety neurosis, where in all probability a disturbance in the activities of the internal secretion of the sex glands must be assumed.

"So we may infer that in morphinism we have to do with an impairment of exogenous origin of the vegetative centres in the ganglia at the base of the midbrain which regulate metabolism. This seems to be the case also in the manic depressive psychoses, while in Basedow's disease and in anxiety neuroses primary changes in the endocrine system destroy secondarily the balance of the regulative centres and so produce a picture such as we see in the stage of the acute symptoms of withdrawal and in manic depressive mixed conditions."

C. C. Wholey—1924.[54]

"The conclusions reached in this paper are based on drug cases appearing in the routine of a general psychiatric practice. In number, the series embraces probably about the average percentage of such cases coming year by year to a neuropsychiatrist in an industrial community such as this. These patients were handled for the most part in the St. Francis and Western Pennsylvania hospitals. They were studied as psychiatric material, the history, environment and constitutional makeup being considered, as in the case of any other neuropsychiatric affection.

"It is customary to discuss the results of morphin and other habit-forming drugs along with the results of metallic poisons such as lead, or of the endogenous toxins of uremia, diabetes, etc., under the general caption of the toxic psychoses. While it is true that the narcotic, or habit-forming drugs, and alcohol, do produce toxic psychoses, the effects brought about by them are essentially different from effects following on the metallic and endogenous poisons. Drug addiction can never be understood, or successfully handled, until this fundamental difference between the action of the habit-forming drugs and that of other poisons and disease processes is appreciated: The metallic and endogenous poisons produce their destructive effects, in the main, more obviously on the physical organism; these effects are generally demonstrable, and understood. The mental effects are secondary. The narcotic, or habit-forming drugs, on the other hand, produce degenerative effects primarily on the mind and character; these arise early, and are more or less permanent. The effects on the physical organism in the case of narcotic drugs are largely functional, and generally eradicable."

* * * * *

"In whatever type of toxicity, metallic, endogenous, narcotic, etc., the obvious and necessary step is to correct, so far as possible, the damage to the physical organism. This correction of the physical condition constitutes, as a rule, practical restoration, or cure, in the case of non-habit-forming toxic injury, reaching, as it does, the essential source of the trouble. But in the case of the habit-forming drug, physical restoration is but the first step toward rehabilitation, or so-called 'cure'; there still remains the mental damage, which constitutes the true dominant therapeutic problem.

---

[54] Wholey, C. C.—The Mental and Nervous Side of Addiction to Narcotic Drugs. J. A. M. A. Aug. 2, 1924. Vol. 83. pp. 321-324.

"Narcotic drugs are used, therapeutically, for the alleviation of conditions affecting the nervous system; the relief of pain or of mental or emotional distress. We naturally, therefore, find their effects, when reaching a pathologic degree, on the nerve organism. In explanation of this pathologic result, it is well, first, to remind ourselves of the elementary fact that we feel and act in accordance with the information that we receive through our sensory nervous system; our special senses of sight, hearing, body surface sensibilities, etc., with all their highly elaborated end-organs. These, through their sensory connection with the brain, keep us constantly informed as to our environment. Under a similar nerve mechanism, we are kept informed as to the status of our own bodies, and personal identity, through the sensory impressions received from nerve terminals, or receptors, distributed in muscles, joints and viscera. Nature has provided no other mechanism by which the organism can inform itself as to its environmental condition or bodily states. In short, the human organism has to depend for self-preservation on this intricate nerve mechanism."

* * * * *

"In a state of normal health, a general sense of well-being prevails. This sense of well-being is a result of the sum total of all sensory impressions reaching the brain; it is made up of the continuous flow of sensations from all the organs of the body to the mind. This flow of sensations we term the general bodily cenesthesia. Unless disease interferes, the person is not aware of or disturbed by this cenesthetic functioning."

* * * * *

"This cenesthesia constitutes the source from which arise the incentives of behavior. In other words, conduct is the end-result of this underlying bodily tone or state of feeling. Under the influence of a narcotic drug, there is an obtunding of the general cenesthetic sense, along with the dulling of any specific pain for which the drug may be used. If this obtunding is continued for some length of time, there is a lowering of tonicity of the general cenesthetic machinery, so that even the customary functioning of bodily processes cannot eventually proceed without inducing a sense of discomfort when obtunding ceases. There is general lowering of the person's capacity for withstanding pain or distress; he must continue obtunding his general sensibility in his effort to maintain a tolerable sense of well-being. This necessity, and instinctive effort on the part of the human organism to maintain itself in a bearable state of being, lies at the basis of addiction; it determines the psychology and behavior of the drug victim.

"Sympathetic System.—Considering more specifically the effects of an opiate on the physical organism, with the accompanying mental and character changes, we find it acting conspicuously on the vegetative, or involuntary, nervous system, with its endocrine extensions, the whole loosely termed at times the sympathetic system. This system, as we know, controls involuntary, or automatic, processes: cardiovascular, respiratory, digestive, secretory, etc., as well as ductless gland functions with their important biochemical relations to the organism. The cardiovascular system in an habitué soon adjusts itself to the support of an opiate. Morphin is a powerful and enduring stimulant of this system. As to the effect of prolonged stimulation, if the organism is supplied needlessly with something that supplants its own effort in any particular direction, it ceases to function in proportion to the substitution; in the morphinist, the support that the drug has imposed becomes evident, on withdrawal, through the tachycardia, sweating, etc., intervening, all indicative of some degree of circulatory collapse, at times fatal. This collapse, or effort syndrome, explains the cardiac distress and pain of withdrawal, and also explains much of the anxiety and feeling of dissolution and panic arising during the withdrawal stage. For these psychic manifestations of anxiety, etc., are constant accompaniments of heart embarrassment whatever the etiologic background—angina pectoris, heart flutter or acute indigestion. These symptoms are a result essentially of dysfunction of the nerve supply to the heart from the vagus, the great upper autonomic representative of the vegetative nervous system.

"Gastro-Intestinal Changes.—The digestive apparatus also is controlled by the vegetative nervous system. Here, in the addict, the organism adjusts itself to the obtunding changes imposed on the secretory and smooth muscle fiber nerve mechanisms by the drug; when the drug is suddenly removed, this pathologic adjustment is reversed, and there is a violent disturbance of integration in secretory and muscle functioning, evidenced in cramps, diarrhea, vomiting and general abdominal distress. Under the drug, constipation is almost universal in the morphinist; on withdrawal, an irritation is produced by the sudden exposure of the drug-obtunded neurosecretory mechanism to the demands of former normal functioning. A temporary overactivity is brought about, resulting in diarrhea. While the drug was being used, a pathologic adjustment could go on without awareness of abnormal processes, because of the narcotizing of the sympathetic receptors in the digestive canal. Such symptoms referable to the digestive apparatus evidence further the apparently selective action of opiates on vegetative processes. In this case, both splanchnic and vagal components are involved.

"Changes in Reproductive Organs.—The functions of the reproductive organs, innervated mainly by the autonomic division of the vegetative system, present well-defined disturbances as a result of opium and its derivatives. Striking changes in both the physiologic and the psychic functions of sex come about. Cessation of menstruation occurs in the female, with atrophy and cessation of function of the mammae. Psychically, this is accompanied by more or less complete loss of all sexual desire, and of the emotions associated with sex. In the male, in advanced cases of morphinism, complete sexual impotence is frequently seen. Both sexes, in extreme addiction, are practically rendered emotionally asexual. On withdrawal of the drug, the individual is often overwhelmed by tumultuous sex desire."

* * * * *

"Such additional involuntary phenomena as yawning and sneezing occurring in withdrawal indicate involvement of the intricate autonomic mechanism brought into overactivity by the release of afferent nerves and receptors from the obtunding effect of the drug. Insomnia is practically universal after withdrawal. The physiologic phenomenon of sleep is a vagontonic condition according to Bauer. The autonomic mechanism controlling this recurring physiologic condition has been disorganized under the influence of the drug. The insomnia is incident on the difficulty of the reestablishment of the normal cycle of wakefulness and sleep, according to Higier."

* * * * *

"When the physiologic functions of the sexual realm are so interfered with, it is not surprising that mental and emotional disturbances should occur. The instinct of sex probably constitutes the chief source of our emotional life and personal conduct. The morphinist becomes indifferent, varying, in accordance with his original character make-up, toward ordinary family ties and obligations. There is a disappearance of those incentives grouping themselves about the family unit—ambitions of acquisition, desire for security against poverty. He becomes improvident and heedless of social esteem. Such character alteration seems to be definitely correlatable with physiologic changes in the realm of sex.

"We may remind ourselves that malfunction in members of the endocrine system, other than those of sex, produces mental and emotional pathologic changes. We have all seen the personality alterations attendant on myxedema, in which the thyroid gland is involved—the emotional dulness and mental defect, and the opposite alterations in hyperthyroidism; the mental sluggishness of acromegaly with its disturbed pituitary gland; the depression of Addison's disease with its basis of dysadrenalism. Such phenomena indicate the close relationship that exists between normal development and maintenance of personality, and balanced activity of the vegetative endocrine system.

"I have called attention to the dependence of the organism for its knowledge of environment and personal identity on the functioning of the general sensory nervous system. This applies both to the voluntary system, the sensorimotor, or cerebrospinal, and to the involuntary or vegetative system; the former putting us in touch with the external world; the latter informing us as to bodily states and personal identity. It has been pointed out that it is through the sensory associations, both somatic and psychic, implanted in the organism, that a habit is built up and maintained. Tobacco was cited to illustrate the manner in which a benign habit may take hold of a person. In this instance there was noted implication of the vegetative system of relatively insignificant character (the pleasurable sensations, etc.); insignificant because the associate-memory factors and conative states laid down remain largely within the control of the volition, in the realm of insight, and outside the domination of automatic impulsion. A habit like tobacco using which does not seriously invade the involuntary nervous system is of benign character; it is when the involuntary, or vegetative, system is seriously invaded, placing the individual more or less outside the realm of volition and insight, that the habit becomes, as it were, malignant, and that serious, it may be ineradicable, alterations take place in the personality."

* * * * *

"In the addict, the mental and character deviations take on a particular coloring, varying with the original constitutional character make-up of the individual, and the relative sensitiveness of the different parts of his vegetative apparatus to the drug. Certain of these deviations can be definitely correlated with alterations in function of particular vegetative activities—as observed in connection with the physiologic changes in the realm of sex due to the drug. In general, the addict becomes timid, fearful, secretive and asocial. Just as the cardiovascular system in an habitué adjusts itself to the physiologic support of an opiate, so in the character realm the habitué adjusts himself psychically to the support of his drug; he finds in it an agent that artificially fortifies him for meeting pain or difficulties. In order to maintain his so-called drug balance, or state of satisfaction, he must continually increase his supporting drug. He is playing a losing game by the necessity of compensating artificially against the weakening of character that inevitably results from the removal of the necessity of meeting obligations and exigencies through the discipline of effort. The normal appetites and hungers by which the organism makes known its needs are to a degree neutralized. The cycles of hunger and appeasement, of wakefulness and sleep, of work and rest, are broken in their normal sequence, and cease to guide the individual along self-preservative lines. He may be chronically exhausted, but realization of the fact may be shut off, and therefore unheeded.

"The drug has the effect of lulling the victim into a sense of security out of keeping with obvious facts of reality. His conduct is determined by these false convictions; the future holds no menace, yet the sheriff may be at his door; he plans confidently for impossible undertakings, though in imminent danger of death from some obvious organic disease. Because of these false convictions, which have gradually and insidiously established themselves in the addict's mind, he often acquires the belief, amounting to a delusional idea, that the drug must be good for him. (In some persons, these beliefs and convictions are of slow growth—over years; in others the altered personality becomes rapidly established.) All this disruption of the processes of thought, and of the vegetative functions that underlie emotional and instinctive reactions constituting the essence of personality, cannot long continue without the fairly permanent establishment of a psychopathologic status. At times, the alteration of personality and judgment becomes so fixed that insight cannot be reestablished and return to the drug will be inevitable, except under restraint."

* * * * *

"Summary.—Habit-forming drugs produce different and more complicated pathologic changes than those produced by other toxins and infectious agents.

"Morphin produces its most serious effects through its action on the vegetative nervous system.

"Habit-forming drugs induce a distortion of normal reflex activities in both sensory and psychic spheres.

"The substitution of a psychopathic status is maintained by increasing the obtunding drug to offset the ever decreasing compensatory efforts of the organism.

"Because of the overwhelming dependence of instinctive and emotional life on visceral and endocrine functioning, instinctive and character deviations follow prolonged disturbance of their activities with more or less permanent changes resulting in the entire personality. This mechanism, I believe, is the essential lesion in narcotic addictions.

"The theory here suggested supplies a basis for the understanding of narcotism on which the entire symptomatology can be adequately explained."

R. Schoen—1924.[55]

After studying the effect of a single dose of morphin on the blood reaction [56] and basal metabolism in normal human beings, the author investigated the behavior of basal metabolism and blood reaction in addiction. The addicted patient on whom the observations were made was a young man suffering from mild parkinsonianism without tremor when at rest. The behavior of basal metabolism, blood reaction, respiration and pupils was observed regularly and recorded graphically. Schoen discusses the results of his observations as follows:

"Extension of the investigation to the condition following regularly repeated doses of morphin led to the surprising result that both the reduction of basal metabolism observed after the first dose of morphin and the acidosis of the blood arise and disappear in addiction with extraordinary rapidity. In this respect they stand in sharp contrast to the effect on respiration and the pupils, which maintained undiminished strength in the same series of experiments. These striking, yet familiar conditions seem to me to prove the relationship of the reduction in basal metabolism to acidosis, which before could only be conjectured. The occurrence of acidosis after morphin is rendered possible by the paralysis of the respiratory centre and the resulting accumulation of carbonic acid in the blood. The direct cause, however, resides in the acid products of metabolism, which are due to reduced oxidation. When this diminution of basal metabolism ceases, acidosis disappears from the blood. The close dependence of altered urinary reaction on the reaction of the blood is shown afresh by their behavior in addiction, as well as by the absence of a fixed relation between the alveolar carbonic acid tension and the blood and urinary reactions, as Endres supposes, so soon as the sensitiveness of the respiratory centre is diminished. While the carbonic acid tension remains completely uninfluenced by addiction, the blood and urinary reactions behave very differently from before.

"In those unused to morphin the secretion of hydrochloric acid by the stomach immediately after administration of morphin is regarded as a compensatory action due to acidosis. This theory is also supported by our experiences of addiction. Schubel demonstrated, for instance, that in dogs this hypersecretion disappears very early in addiction and a 'secretion narcosis' occurs. This may be explained naturally by the disappearance of acidosis.

---

[55] Schoen, R.—Zur Kenntnis der Morphinwirkung beim Menschen. II. Mitteilung: Die Veränderungen des Grundumsatzes und der Einfluss mässiger Gewöhnung auf Grundumsatz, Blutreaktion und Atmung. Arch. f. exp. Path. u. Pharm. 1924. Vol. 102. pp. 205-216.

[56] Schoen, R.—Zur Kenntnis der Morphinwirkung beim Menschen. I. Die Veranderungen der Blutreaktion und ihre Begleiterscheinungen. Arch. f. exp. Path. u. Pharm. 1924. Vol. 101. pp. 365-382.

"For a general understanding of the morphin addiction which Faust's experiments show to be due in part to rapid destruction of morphin in the bodies of animals the fact is of unquestionable importance that the initial reduction of metabolism very quickly gives place in presence of addiction and then is seen to undergo a transformation to increased metabolism. Without discussing this intricate problem, it may be conjectured that this increase in metabolism contributes materially to the rapid destruction of morphin as a cause of addiction.

"The object of the reports given has been to study the influence on the blood reaction of diminished sensitiveness on the part of the respiratory centre as the general respiratory mechanism of the blood reaction. Analysis of the changes observed threw light also on the reaction of morphin, the agent used. If paralysis of the respiratory centre by this alkaloid is taken as the principal point of consideration, the alterations occurring in the blood and urinary reactions, probably that also in the gastric juice, may be explained as secondary consequences, as likewise—a connecting link to increased carbonic acid tension in the blood—morphin myosis (Wieland and Schoen). The altered metabolism which precipitates the condition of acidosis in the blood seems unconnected with the respiratory centre. This is especially shown by the different conduct of these in addiction. Campbell's observations have demonstrated succinctly that hyperventilation from alkalosis produces increased metabolism, and that acidosis and alkalosis on their part, in presence of decided paralysis of the respiratory centre, may cause metabolic changes. Although experience with morphin seems on the other hand to show the acidosis to result from the diminished basal metabolism, still the contemporary occurrence of an altered blood reaction (on paralysis of the respiratory centre) and of metabolic alterations is a phenomenon of more general significance.

"If we are very far from a uniform explanation of the action of morphin, at least the way is plain in which we can simplify the complicated picture by throwing light upon the mutual relationship of certain of its phenomena."

* * * * *

"In human beings at rest basal metabolism was reduced about twenty to twenty-five per cent in the first hour after injection of morphin in doses of one and two centigrams. Repeated doses were attended by very rapid disappearance of this diminished metabolism and by a return to the initial level. At the same time the acidosis previously described (section 1) as following morphin, also disappears. From its behavior during addiction, which at this early stage gives no evidence of affecting the respiration and the pupils, the conclusion is reached that the acidosis resulting from morphin is caused by the increase of acid products of metabolism consequent on reduced basal metabolism. A warrant for this is the failure of the reaction regulating function of the paralyzed respiratory centre."

B. Legewie—1924.[57]

This author reports a detailed history of a case of delirium in morphinism, which although rarely observed is caused, he believes, by morphin abstinence and not by the primary disease. He states:

---

[57] Legewie, B.—Delirium bein Morphinismus. Zugleich ein Beitrag zur Frage der Morphingewöhnung. Ztschr. f. d. ges. Neurol. u. Psychiat. 1924. Vol. 89 pp. 558-578.

> "The case represents a peculiar type of man in whose family history morphin played an important role, who showed a personal and family tendency to delirium and who for many years has been a marked gastrointestinal hypochondriac. When he was 58 years old he became ill with cancer of the rectum and on account of great pain was given morphin. It is certain that he himself never took morphin publicly or privately and that his dose was increased very gradually until it reached (before the delirium) 0.06-0.08 g. daily. From the beginning he showed an oversensitiveness to the morphin with symptoms such as muscular spasms, marked trembling of the whole body and chills. Psychically at first he experienced a phase of productive euphoria lasting for a month and followed by a like period of lethargy. Three months after the administration of the first dose of morphin and three months before death the first signs of a progressive derangement appeared. At first there were hallucinations which in the beginning he corrected himself and later others easily handled. The symptoms gradually increased, he became more restless, disoriented, thought himself followed, failed to recognize his surroundings, suffered from frequent and especially optical hallucinations, and showed great motor excitation. But there were no symptoms of circulatory weakness or other changes in his physical state. At the height of delirium he showed marked stupefaction. Upon a relatively large dose of morphin the delirium ceased abruptly. Until death, which took place eight days later, the patient remained under the influence of large doses of morphin, showing symptoms of intoxication such as nausea, salty taste, etc., but psychically he was self-possessed and normal. On the day before death the first symptoms of circulatory weakness showed, and then followed sudden death in spite of a relative state of well-being."

Speaking of the origin of the delirium, the author states:

> "If from a differential-diagnostic point of view we were to enumerate the causes involved, we should have to consider only the possibility of origin in exhaustion or inanition, in the organic or toxic action of the carcinoma, in an autointoxication from constipation or in the action of the morphin."

Legewie disposes of the first four possibilities and explains his hypothesis that the action of the morphin accounts for the delirium as follows:

> "There are two other reasons for attributing the origin of the delirium to the morphin. In the first place undoubtedly with the beginning of the morphin administration there appeared also a change in the patient's psychic state. At first we observed a euphoric overproduction, which could be distinguished from the usual euphoria of chronic morphinism by its nature and intensity. The patient showed none of the general high spirits of complete comfort. On the contrary from the earliest injection of morphin there appeared such unpleasant symptoms that after a short time he feared injections. Also he himself was unaware of his high spirits. For this reason if they faded he could show no desire to renew them with a further dose of morphin. But in fact he *was* in high

spirits. For, apart from his inclination to joke, which postulates a general feeling of comfort, how else could such functional increase be explained? This picture represents a slightly hypomanic state rather than the usual euphoria of morphinism. Yet there could be no doubt as to the existence of some relationship to the morphin administration. I prefer to consider it a positive effect of morphin analogous to the usual euphoria, but corresponding to the other unusual reactivity of our patient to morphin.

"The same applies to the subsequent state of loss of interest and increased depression—at this time also there was a positive action of the morphin on the cerebrum.

"Following upon this state there began gradually a psychotic alteration which seemed to have no connection with the previous state and which slowly increased to the point of delirium. Now we come to the second cause which touches upon the relationship of the morphin administration, namely, the prompt control of the delirium by morphin upon the administration of a dose considerably larger than that previously administered. It is not likely that a delirium produced either directly or indirectly by the primary disease shortly before death and therefore at the height of the exhaustion, constipation, or cachexia, could cease upon a relatively small dose of morphin. This became the more obvious to me when I myself at first thought of an autointoxication psychosis. This is supported further by the fact that there must have been an under-supply of morphin. Also the patient when the dose was withdrawn again reverted to physical and mental discomfort. Upon repeatedly high doses the patient remained quiet. In our case therefore the morphin at first showed a marked alteration in the whole psyche, a change which doubtless may be caused by morphin intoxication but which varies from that usually formed in morphinists by reason of the peculiar constitution of our patient. On the other hand underdosing for a long period was sufficient to produce a delirium which promptly was controlled by a corresponding increase in the dose. In both cases, there was a marked action of the morphin on the cerebrum. It is certain, however, that both series of symptoms did not run simultaneously. Probably they followed each other but they were antithetical. If we consider the one as a positive action such as chronic intoxication, we must consider the other a negative one such as the effect of abstinence. It cannot be a positive morphin injury through chronic abuse because otherwise under the prevailing conditions there could be no stopping of the delirium with an increase in the dose. This applies also, if we agree wtih Chotzen as to the psychotic symptoms being an indirect effect of the morphin, in relation to the general prostration brought about by the morphin intoxication. It is not possible to see why the symptoms of poisoning of a psychical nature appear so often after the withdrawal of the drug as was the case in two of his four patients who were 'pure' morphinists, except on the basis that the prostration must have progressed upon the further administration of the morphin and led to a delirium at the same time during the abuse of morphin. The lack of a desire for the drug in our patient was striking. There must have been involved at one time influences affecting the personality of the patient upon which the morphin history showed little light; but then also the secondary symptoms were so great that they created a natural resistance. I do not think that a true morphinist, a person morbidly desiring morphin, with an opportunity to obtain a further supply would have run blindly into a delirium. Still I do not think that from this lack of desire we should conclude that there was any different reaction from that of pure morphinism in our patient during abstinence.

"Therefore for me it is beyond doubt that the morphin produced the delirium. The lack of morphin led to the delirium or, in other words, we have here in a delirium susceptible psychopath during the pure use of morphin an *abstinence delirium*. Therefore this case offers an exception to the view held by Bonhoeffer cited above."

Torald Solmann—1924–1926.[58] [58a]

In a report of experiments dealing with the effect on the growth of white rats of chronic poisoning by certain drugs, the author, 1924,[58] gives the following conclusions as to the effect of the morphin group:

"Morphine, codeine and heroin increase body weight materially above the normal control animals; with codeine, the increase continued throughout the twenty-seven weeks, even with daily doses rising to 870 mgm. per kilogram. With morphine, the increase of body weight turned into a sharp and steady decline, after 11 weeks, even when the daily dosage had reached only 2.5 mgm. per kilogram. With heroin different groups of rats gave discordant results."

* * * * *

"The rats often showed a marked preference for the drugged food; but this occurred also with non-addiction drugs, and was probably not due to 'craving,' but to other, accidental causes. No 'abstinence symptoms' were noted on temporary withdrawal."

As to the late mental and physical effects of opium addiction in human beings,[58a] Sollmann says:

"The life of the addict is dominated by the abstinence symptoms that start when the effect of the dosage begins to wear off; by the consequent need of obtaining the drug at any cost; and often by the fear of detection. If the supply is regular, the addicts may appear quite normal; so much so that the addiction may be kept secret for many years, and the addict may occupy responsible positions. Close observation, however, would generally reveal signs of the addiction; especially variability of moods, depressed or stimulated, according to the interval since the last dose.

"Opiate debauches doubtless accentuate the weaknesses of moral character from which they originate. They tend to make their victims slothful, apathetic and unreliable. They do not lead to the more active crimes, as cocaine may; except in so far as crime may be necessary for obtaining the drug.

"The addicts of inherently good character, if they take the drug solely to ward off the intolerable depression, are not so seriously affected. Their will-power and self-reliance is weakened, as by any other enslaving self-indulgence, and the agony of drug-deprivation drives them to deception and more serious crimes when their supply is threatened; but outside of this, their character and mental faculties are said to remain practically normal. A large part of the traditional depravity of the addicts exists in the minds of the public, rather than in life. This pariah-attitude makes it more difficult for the addicts to lead a normal life, and thus tends to drive them into the very vices of which they are accused. (Bishop).

---

[58] Sollmann, T.—Studies of chronic intoxications on albino rats. VII. Local anesthetics; morphine group; chloral. Journal of pharm. and exper. therapeutics. July 1924. Vol. XXIII. No. 6. pp. 449-459.

[58a] Sollmann, Torald—A manual of pharmacology. 3d ed. 1926.

"Physicians should look upon drug addicts as patients with a nervous disease. Like other nervous patients, they must be treated with firmness, but also with sympathy and kindness.

"The moderate use of opiates may not produce any definite physical deteriorations. Animals, at least, may even gain in weight, presumably by being less active. With more severe addiction, the digestion becomes seriously disturbed, obstinate constipation alternating later with equally obstinate diarrhea, loss of appetite alternating with voracious hunger and thirst and polyuria. The patient loses weight rapidly, and suffers from marasmus and cachexia.

"The *skin* becomes hard, pale, dry and rough; sometimes, of a peculiar waxy appearance. The nails, teeth and hair are also diseased. The condition of the integument is rendered worse by the local effects of the injections when the drug is used hypodermically. The whole skin may be mottled with scars and marks of recent or older injections, and abscesses are often produced through want of cleanliness.

"The *pupils* are usually contracted. The pupillary and accommodation movements are affected. The *heart* may become irregular. *Albuminuria, glycosuria* and *amenorrhea* are frequent. The *sexual functions* are lessened (functional impotence, sterility), but usually return on withdrawal. (Wholey, 1912.) Fevers resembling simplex, intermittent, and typhoid are seen. The *motor-nervous system* shows considerable change: nervous tremors, increased reflex irritability, etc. These conditions sooner or later weaken the *resisting powers* of the patient, so that he falls an easy prey to some other ailment, and thus rarely reaches old age. However the habit may persist for over thirty years (McIver and Price)."

L. Stern-Piper—1925.[59]

This author studied the rate of sedimentation of the blood of ten cases of chronic morphinism and six of eukodalism, both during addiction and during withdrawal, according to the technique used in an earlier study in relation to post-encephalitic disturbances analogous to that used in expressing the different degrees of fixation in the Wassermann reaction.

He found that in nine of the ten cases of morphinism tested during addiction the rate was accelerated, while in one it was retarded. During withdrawal, however, the rate gradually lessened, reaching normal in four and one-half to five months. Practically the same results were obtained in the cases of eukodalism, although they were found to be much less definite.

---

[59] Stern-Piper, L.—Die Senkungsgeschwindigkeit des Blutes bei chronischem Morphinismus und Eukodalismus. Berl. Klin. Wchnschr. 1925. Vol. 4. p. 548.

On the basis of his experiments the author speculates as follows:

> "From the theoretical point of view, in analogy with the concept of Linzenmeier of the processes of sedimentation acceleration as a defensive reaction of the plasma to the introduction of foreign proteins, with the attendant increase in the globulin fraction at the expense of the albumins, the same phenomena might be conceived to take place as a defense mechanism against the morphin in the circulating blood in chronic cases, or against certain decomposition products which may be produced. Possibly the formation of these latter substances may be associated with a chronic stimulation of the parasympathetic system by the poison, in accord with the theory of Wuth that assumes an increase in tonus of the parasympathetic during habituation and during abstinence a tonic change in the sympathetic. That in *in vitro* experiments, as I have found, morphin does not cause an acceleration, but rather a transitory retardation of the sedimentation velocity, cannot be adduced as evidence on this point. In the test tube morphin is also weakly hemolytic. But for the formation of the defensive substances a chronic stimulation by the poisons must require a comparatively long time, such as can only be evidenced *in vivo.* During the process of deprivation it must be assumed that with the suppression of the poison or with the lack of the decomposition products caused by its stimulation, the sedimentation velocity gradually diminishes. That, as Wuth assumes, endocrine principles, possibly associated with an hyperfunction of the thyroid, are to be found in the blood during the period of withdrawal of the drug, does not directly oppose the fact of the loss in acceleration during abstinence, since it must be assumed that these substances, as native to the body, exert no accelerating effect upon the sedimentation velocity."

* * * * *

> "My studies should stimulate further work upon the question of the relations of sedimentation velocity in morphinism. If my observations can be confirmed by tests on a larger number of cases, *the sedimentation velocity rate should prove of diagnostic value in cases where there is a chronic morphinism due to injection of the drug. The method should also serve to distinguish whether a patient has relapsed again or whether he is still in the chronic stage of addiction.*
>
> "As for the question of the duration of the process of breaking away from the use of the drug the test may be of the greatest clinical importance. If my experience affords an index, cases—with an initial, very strongly positive reaction which gradually becomes reduced during the period of deprivation—should always be kept under control up to the time that the sedimentation rate is restored to normal, that is, for at least four to five months.
>
> "Further, it must never be forgotten that the value of the method is limited, in that other disturbances, particularly the infectious diseases, must be excluded.

> "As for the value of the method in eukodalism no definite statement can be made, although in this condition also changes in the rate of sedimentation have been observed. Further studies are here necessary. For the diagnosis of eukodalism, as well as for a means to determining the duration of the period of deprivation in this condition the validity of the sedimentation velocity determination cannot at present be considered."

Lawrence Kolb—1925.[60]

The author distinguishes between the pleasure and relaxation of relief from pain, and the mental pleasure derived by certain individuals from the use of opium. The former of these states is a *negative* pleasure, the latter, a positive one. Individuals, he states, who receive *positive* pleasure from opium continue its use until it becomes a physical necessity, increasing the dose as more of the drug becomes necessary to produce the effect. As tolerance is established, positive pleasure is decreased and practically the only pleasure then received from the drug is that arising from the relief of withdrawal symptoms. After the first stage of addiction, when supplies of opium are irregular, the addicted individual passes through periods of comfort and discomfort to which is added the anxiety arising from police activities and the fear that the next dose will not be available. He is restless, discontented and unhappy, and more and more of the drug is necessary to maintain comfort, until a point is reached where pleasure is overshadowed completely by pain. At this point frequently addicts seek treatment and when, after this, their health improves, the fundamental psychic distresses for the relief of which the drug originally was taken again assert themselves and with the memory association of the pleasure opium once gave relapse is almost certain, with a recurrence of the former cycle of events.

The author finds from his studies that the intensity of pleasure produced by opiates is in direct proportion to the degree of psychopathy of the individual in question, and that the subsequent repression from long-continued use carries him as far below his normal emotional plane as the first exaltation carried him above it. The author continues:

> "The unhappy state into which addicts of long standing finally descend is such that a superficial examination of a group of them with low native intelligence or lack of education might lead one to believe that only a small

---

[60] Kolb, Lawrence.—Pleasure and deterioration from narcotic addiction. Journal of Mental Hygiene. Vol. IX. No. 4. Oct., 1925. pp. 699-724.

proportion of them ever received pleasure from opium apart from that involved in its power to relieve withdrawal symptoms.

"With few exceptions they say: 'It only makes me comfortable.' This explanation is apparently true for most, if not for all, nervously normal people who become addicted, but it is not true of the abnormal type who make up the bulk of addicts of the present time—and it is probable that no person who deliberately addicts himself fails to derive pleasure of some kind from the drug. When the addiction history of a group of addicts is studied carefully, it is found that practically all of the psychopaths and neurotics among them have for a longer or shorter period experienced some sort of mental pleasure from the use of opiates. But most of the cases are seen by physicians long after the memory of the short period of pleasure has been beclouded by the distress that later ensued. This distress causes them to seek relief, and it is uppermost in their minds. They are, therefore, honest when they claim to take the drug only to prevent suffering.

"The examination of intelligent people able to give expression to their feelings is more satisfactory, and it is mostly from these that we discover the secret of how the pleasure that opium induces in psychopaths allures them into addiction in the first place and causes them to relapse time after time.

"Whether opium causes pleasure to absolutely stable individuals is difficult to decide. Fourteen per cent of the addicts in the series of cases (230 in number) with which this paper deals were classified as having been normal before they became addicted, and a few of these received pleasure from the drug that did not seem to be a mere contrast with the discomfort that it relieved. The examination of these apparently normal cases that received unusual satisfaction from the drug was not, however, as thorough in all of its phases as was desirable, and it is possible that a more extended study of the cases would have disclosed traits of personality or abnormal trends that would have justified placing them definitely among one of the nervously abnormal classes referred to in an earlier paper."[61]

The author then cites a case in illustration of the fact that normal individuals sometimes derive pleasure from taking an opiate. He continues:

"Against apparently stable persons of this kind who receive pleasure from opium are the thousands of persons who have taken an opiate prescribed by physicians without feeling anything but drowsiness and relief from actual pain. It would appear from this that those individuals who are made happy by opium must have some special mental conflict that the drug relieves, even though they are not nervously abnormal in the ordinary sense.

"In one series of twelve professional men among these cases who admitted receiving pleasure from opium, ten had either been drunkards or were neurotic individuals before they became addicted. The father of one of the others had migraine; a sister, epilepsy; and a brother, aged twenty-eight, died of apoplexy. The addict himself had apparently been normal, but was always timid and somewhat shrinking in his contact with other people.

---

[61] Drug Addiction in Its Relation to Crime, by Lawrence Kolb, M.D. Mental Hygiene. Vol. 4, pp. 74-89, January, 1925.

"Another professional man who derived pleasure from cocaine felt none whatever when he later became addicted to morphine.

"The more nearly normal of the abnormal cases referred to above had been addicted twenty-two years. His father was neurotic and had a strong tendency to despondency; a sister died of apoplexy. The patient himself had a normal, open make-up as a boy in so far as outward appearances and social activities were concerned, but with it there was a feeling of bashfulness and a disposition to be easily discouraged. Like a brother of his, he always shrank from pain and his attitude may be best indicated by his description of what to him were the horrors of treatment for drug addiction. His body, he said, felt as if it were being placed alternately in fire, scalding water, and acid. He was successful in his profession, a respected citizen, and took an active part in politics, but always felt ill at ease when required to take a leading part in any gathering. He found that opium gave him confidence and enabled him to meet people without inwardly shrinking and without feelings of restraint. This was not interpreted by him as pleasure, but he described what he called a condition of ecstasy which once came over him, after a hard day's work, while he was riding to the barn on a load of hay. This was before he started to use the drug, but he has experienced a similar feeling a few times since, following hypodermic injections. It is probable that the feeling he described is akin to that aroused sometimes in normal people by the pleasurable relaxation and satisfaction that supervenes upon the completion of a difficult task.

"It frequently happens that the first experience with opium produces more pleasure than any subsequent indulgence arouses. When the first dose is taken for illness, the added factor of relief from physical pain furnishes a ready explanation for this—and the rheumatic physician who struggled to stay awake never again experienced the same intensity of feeling. In other cases the explanation probably is that its newness is an added charm."

* * * * *

"The expressions that addicts make use of in describing their sensations illustrate better than anything else the mental pleasure that opium gives abnormal persons. At the same time they show the neurotic basis of addiction by indicating emotional conflicts or feelings of inadequacy, the relief from which is expressed as pleasure. The following are some of the common statements made:

" 'It makes my troubles roll off my mind.'

" 'I do not have a care in the world.'

" 'It is exhilarating and soothing.'

" 'You do not care for anything and you feel happy.'

" 'You have a contented feeling and nothing worries you.'

" 'It stimulates you and makes you forget, so you don't care about anything.'

"'It makes you drowsy and feel normal.'
"'It causes exhilaration and a feeling of comfort.'
"'A deadening, pleasurable effect.'

"A clear inference from the foregoing expressions is that opium produces in these cases a feeling of mental peace and calm to which they are not accustomed and which they can not normally achieve."

* * * * *

"A better description of the pleasurable effect of opiates than the average untutored addict gives might be expected from highly educated persons. One of these, typical of others, said it caused a buoyancy of spirits, increased imagination, temporarily enlarged the brain power, and made him think of things he otherwise would not have thought of.

"In addition to the mental pleasure produced by opium, some addicts receive a pleasurable physical thrill of short duration and varying intensity immediately following an injection of morphine or heroin. As the intensity of this thrill wanes with increasing tolerance, some resort to injections directly into the veins in order to bring it out in full force again. It is largely this thrill which addicts have in mind when they speak of the 'kick' that the 'shot' gives them. Most of them describe it as a feeling of warmth that quickly spreads through the abdomen following an injection. The description suggests vasomotor relaxation with increased blood to the parts. In some cases the thrill spreads throughout the entire body and then gives intense pleasure. Striving for a repetition of it naturally leads to larger doses.

"The physical thrill apparently sometimes takes a sensuous character. An addict with an intelligence quotient of 110, who described the mental effect as 'a feeling of comfort so that nothing worries you,' said, in regard to the physical thrill, that it was a pleasurable, tingling sensation that passed over the entire body. He linked this sensation with sexual feeling and mentioned that some of his associates gave it the same coloring. Another psychopath, with an intelligence quotient of 88, described the sensation as a thrill through the body lasting seven or eight minutes and resembling the sexual orgasm. The brother of this patient derived intense pleasure from the thrill, but said that it did not in any way resemble sexual feeling.

"None of the thirty-one nervously stable addicts in this series of cases had experienced anything but a slight feeling of warmth in the abdomen following injections of morphine or heroin. This was considered pleasurable except in so far as it was a part of the general feeling of comfort and relief that is brought on in all addicts when a needed dose wards off oncoming withdrawal symptoms. The apparent immunity to the thrill of normal persons who become addicts may be explained in part by the fact that such addicts do not take 60 grains of morphine daily nor do they inject the drug directly into the veins, but in the psychopaths the degree of pleasure seems to depend upon the degree of psychopathy, and it is possible that the sympathetic nervous system of these abnormal cases may be so constituted as to be more susceptible to the influence of narcotics."

He then proceeds with a discussion of the use of cocain and the sensations arising therefrom, after which he states:

> "As would be expected, cocaine and an opiate combined give more intense pleasure than either of these drugs alone. . . ."

Under the heading of "Deterioration," the author continues:

> "The production of pleasure by such unnatural means as the introduction into the organism of substances that distort body functions and change the flow of emotions, so that for the time being there is a different outlook on the world, may be expected to bring about a gradual change in character, mentality, and physical condition that in most cases would be harmful. This expectation is in part realized in the majority of cases. In fact, the continued use of opium or cocaine is always harmful physically, but in studying the effects of these drugs on the mental and moral characteristics of addicts it is important to consider the type of persons from whom they are recruited and judge each individual addict according to what he was before he became addicted. An influence that injures a normal individual by perverting his normal body functions may improve an unstable individual by changing his perverted functions. In an earlier paper the writer has indicated how that property of opium which produces lethargy and idleness in normal persons may express itself as a temporary stabilizing influence in criminal psychopaths by blotting out the underlying stresses that give rise to the irritability, discontent, and unrest that result in the commission of crime. The soothing effect of the drug causes in one case the loss of ambition for useful work, and in the other an abatement or suppression of abnormal or antisocial impulses.
>
> "In evaluating the effect that narcotics may have produced in any given case, it is necessary to have clearly in mind, and to consider collectively, the original character of the person, the physical harm that the drugs have done to him, the mental and moral consequences of the physical difficulties, the stabilizing influence, if any, that may have been exerted by the drugs, and the demoralizing effect upon the addict of being looked upon as an outcast or criminal.
>
> "There is a widespread belief that addiction to opium leads rapidly and inevitably to moral deterioration. This belief has arisen through a failure to appreciate that the psychopath who was originally a murderer, thief, drunkard, or social offender of one kind or another is more susceptible to addiction than stable people—and during the past thirty years the public psychology with regard to drug addiction has been such that normal addicts have concealed their addiction whereas the delinquency of the psychopathic addict has kept him in the public eye. The consequence has been that practically all addicts with whom the public has been acquainted have been deservedly despised, and the inference that the addiction was solely responsible for their antisocial behavior and useless lives was inevitable.
>
> "When addicts are carefully studied, it is found that some of them have not been injured morally or mentally. A larger proportion have deteriorated morally, and a few, chiefly former drunkards, have been helped by opium.

Intellectual deterioration is apparently never due to the use of an opiate alone. Morphine and heroin have not been found to differ in so far as the degree or kind of deterioration produced by them is concerned. Cocaine is a much more injurious drug, and it seems that most of those who have deteriorated have used both an opiate and cocaine.

Degree of Deterioration: Different Types

"That individuals may take morphine or some other opiate for twenty years or more without showing intellectual or moral deterioration is a common experience of every physician who has studied the subject, and years ago, when addiction was much more common than it is today, many practitioners had one or two such cases among their patients. In this series most of the normal cases, and many of the neurotics, have not suffered any demonstrable moral or mental deterioration.

"The statement that certain addicts have not deteriorated does not mean that they are of the highest type of citizen. The highest type of citizen is a moral individual with superior intellect balanced by a normal flow of emotions and with a personality undisturbed by nervous instability of any kind. Very few persons answering to this description ever become addicted except through the necessities of unusual stresses, and their addiction is usually quickly cured when the stress is relieved. What is meant is that these addicts started off with a varying degree of mental and moral equipment that has not been demonstrably changed by opium.

"The criterion for lack of deterioration in individuals originally useful and in good standing in the community has been continued employment in useful occupations, the respect of associates, living in conformity with accepted social customs, avoidance of legal prosecution except those brought about by violations of narcotic laws, undiminished mental activity, and unchanged personality, or, when this could not be determined, the possession of a personality that would be considered by psychiatrists to be within the range presented by nervously normal individuals or mild psychoneurotics.

"We think it must be accepted that a man is morally and mentally normal who graduates in medicine, marries and raises a family of useful children, practices medicine for thirty or forty years, never becomes involved in questionable transactions, takes a part in the affairs of the community, and is looked upon as one of its leading citizens. The same applies to a lawyer who worked himself up from a poor boy to one of the leading attorneys in his county, who became addicted to morphine following a severe abdominal disease with recurrence and two operations, and who continued to practice his profession with undiminished vigor in spite of his physical malady and the addiction."

* * * * *

"In one group of twenty-five professional men who were carefully studied from the standpoint of deterioration, seventeen had suffered no apparent mental or moral deterioration. Four of these had always been shrinking, fearful neurotics. One had been a drunkard who had apparently been lifted out of the gutter into respectable citizenship by his shift from alcohol to morphine.

Two were apparently above the average in mental and moral stability, and the remaining ten were evenly divided between average normal individuals and persons who in early life, before they began to use opium, had brought more or less discredit upon themselves by indulgence in alcohol, but who had always been socially useful.

"Of the eight deteriorated cases, two had been extreme drunkards before becoming addicted to opium. One of these had been cured of his addiction, only to relapse into whiskey. He was seldom sober. One, now off the drug for nine months, was a respected citizen who had spent much time and money in treatments that were not permanently beneficial. Another highly neurotic individual whose mother was insane is also off the drug. He had suffered several relapses. One, a former drunkard, was suffering from cerebrospinal syphilis and morphine addiction. One, now practicing medicine, once gave up his practice for ten years in order not to tempt himself with opiates. He resumed practice only to relapse, but has now been cured for eight months. Of the two remaining cases, one had delirium and hallucinations of hearing before he became addicted, during and for several months following attacks of malaria. 'Voices' also bothered him several times in the course of and for a short time after cures for addiction. The other case, a cocaine-morphine addict with poor heredity, had definitely deteriorated.

"Barring the addict who had hallucinations of hearing before becoming addicted, only two of the eight had deteriorated mentally—and with the possible exception of the syphilitic patient, none had deteriorated in the intellectual sphere.

"The relative amount of harm chargeable to narcotics and to other factors in these eight cases is difficult to determine with certainty. It is believed that opium and cocaine have contributed materially to the ruin of the two that deteriorated mentally, and have lowered the moral tone and decreased the social efficiency of all of the others. The moral slump was slowed up, but not arrested, in the two drunkards by the change from whiskey to opium, but both of them might have been respectable and much more useful citizens had they avoided both of these poisons."

The author speaks of the mechanism of deterioration in what follows:

"The greatest degree of deterioration occurs in the group of addicts recruited from among carefree, pleasure-seeking young persons who are mildly neurotic or whose personalities deviate somewhat from the normal. The stability of more nearly normal addicts enables them to carry on efficiently in spite of their addiction, and the criminal psychopaths are already so devoid of moral sense that but little more deterioration is possible with them, while in many of the inebriate addicts, where the narcotic is substituted for excessive doses of a more destructive poison, deterioration is sometimes arrested or retarded by the change from alcohol to opium.

"The mental and moral deterioration due to opium is traceable to the physiological effect of the drug and the social consequences of a life of addiction.

There is no destruction of protoplasm such as follows prolonged excessive use of alcohol. Neither nerve cells nor fibers degenerate; consequently the drug cannot produce diseases analogous to Karsakoff's psychosis, acute hallucinosis, or alcoholic multiple-neuritis, and hospitals for the insane have remarkably few cases diagnosed as drug psychosis. Such psychoses are so rare that one is led to suspect that Case 72 is typical of most of those that do occur.

"Morphine and heroin, when taken in large doses, sap the physical and mental energy; lethargy is produced, ambition is lessened, and the pleasurable feeling already described—that all is well—makes the addicts contented. These various effects cause them to pay less attention to work than formerly; consequently, they tend to become idlers and dependents, but only a small proportion are made idlers by this means alone. Those who depend upon the illegitimate traffic are sometimes unable to work because of discomfort and weakness due to insufficient narcotics, and at other times they stay away from their work in order to look for the drug. There are cases in this series who have gone to distant cities regularly to get an ounce of heroin or morphine, and others who have lost as many as a dozen jobs through neglecting work to meet their peddlers or through lying in bed in the morning instead of going to work because the dose that would have put energy into them was not available. Often, when these cases secure a supply, after their short periods of deprivation, they take more than is actually necessary to keep them comfortable. The result is that they alternate between physical and mental irritability and physical and mental lethargy. Both extremes make for emaciation, physical inefficiency, and unusual mental reactions.

"The dreamy satisfaction and the pleasurable physical thrill produced by opium in many addicts in their early experiences with it are of themselves forms of dissipation that tend to cause moral deterioration. Addicts as a rule are compelled to associate with persons of low moral character in order to continue their addiction. Financial embarrassment resulting from idleness or the high price of peddled narcotics impels them to beg money from their friends, obtain it from members of their families by subterfuge, or steal, in order to supply themselves with drugs; they suffer in manliness through feeling what they often consider the just contempt of the public; they suffer more through their constant fear of arrest or because of a term in the penitentiary served for having narcotics in their possession.

"The whole train of events above described brings about unfavorable character changes and gradual moral deterioration, and converts what might have been fairly useful citizens into outcasts, idlers, or dependents.

"It has been difficult in some of the cases to determine whether the moral deterioration has been wholly or partly due to drugs or whether it would have occurred in the natural evolution of their personalities. When a boy is so incorrigible that it is necessary to train him in a reformatory, not much is expected of him. The same is true to a less degree of the neurotic child who has been petted, pampered, and spoiled by his parents. The deteriorated cases comprise some whose early life histories conform to the above and who may have been useless in any event, but the study of their life histories seems to show that narcotics added a handicap which made them worse than they otherwise would have been."

Of the effect of addiction on industrial efficiency, Dr. Kolb states:

"In connection with the deterioration caused by addiction, the industrial records of 172 of these cases have been surveyed. The records were considered to be good or fair in 88, and irregular or unsatisfactory in 84 cases.

"The criterion for a good or fair record was continued employment and satisfactory work. Housewives who performed their household duties with average efficiency for the social class to which they belonged were classified with those having good records. A sojourn in the penitentiary for violation of narcotic laws has, in this classification, not been allowed to vitiate an otherwise good industrial record. Some cases who were self-sustaining, but who worked in inferior positions because of their addiction, have been classified as having poor records. The percentage who have good records is probably surprising to those who accept the general view that addicts are almost invariably useless characters. The percentage might have been higher but for the inconvenience caused in some of these cases by necessary narcotic laws.

"Of the entire number, 51.2 per cent had good industrial records, but if the professional men and colored people are excluded from the reckoning, only 42 per cent had good records. The records were good or fair in 18 of 24 of the professional men, and in 18 of 24 colored persons. The reason for the percentage of good records shown by the colored addicts is that most of them were recruited from normal individuals. The professional men maintained themselves on a higher plane of industrial efficiency because of their superior intelligence, higher average of nervous normality, and more advantageous position from a financial standpoint. Three of the six professional men rated as irregular or poor owed their industrial inefficiency to excessive drinking before they became addicted to drugs. Two, one of whom is rated as very poor, were harmed by morphine and cocaine, but the probabilities are that both of these cases would have made an unsatisfactory showing in any event. The other one has always been self-sustaining, but is rated irregular because his struggle with narcotics impelled him to accept for a time a position financially and socially less satisfactory than his education and training should have afforded.

"No case classed as nervously normal in this entire series showed a poor industrial record, but in some abnormal cases the record was good. The psychopathic nature of some of these cases was such that even without narcotics nothing but an idle, aimless life could have been expected. Some of the inebriates had good industrial records, and the history presented by a few of them seemed to indicate that had they not changed from alcohol to opium, they would have been useless drunkards."

The author summarizes as follows:

"Opiates apparently do not produce mental pleasure in stable persons, except a slight pleasure brought about in some cases by the reflex from relief of acute pain.

"In most unstable persons opiates produce mental pleasure during the early period of addiction. The degree of pleasure seems to depend upon the degree of instability.

"A large number of addicts experience a pleasurable physical thrill following injection of morphine or heroin. Normal addicts experience this thrill in only a very slight degree, if at all.

"Cocaine may produce pleasurable stimulation in both the normal and abnormal, but the pleasurable effect is slight in nervously normal individuals.

"Nervously normal opium addicts apparently do not undergo appreciable mental or moral deterioration, but this class of addicts constitutes only a small proportion of the total number in the United States.

"Much of the moral deterioration attributed to narcotics in the past was not deterioration, but an original nervous instability and moral obliquity.

"Mildly psychopathic individuals deteriorate more because of their addiction than any other class of addicts.

"No preparation of opium produces any appreciable intellectual deterioration.

"If there is any difference in the deteriorating effect of morphine and heroin on addicts, it is too slight to be demonstrated clinically.

"Cocaine is much more harmful than opiates and long-continued use of addiction doses of cocaine is destructive both to the physical and mental well-being of any type of person."

K. H. Collins and A. L. Tatum—1925.[62]

These authors report observing in dogs, during the course of certain experiments in chronic morphinism, a conditioned salivary reflex, as follows:

"Dogs were given subcutaneous administrations of morphine sulphate daily. A small amount of morphine (30 to 80 mgm. per animal) produces in the dog salivation and usually emesis and defecation. After seven or eight daily administrations of morphine these dogs salivated profusely and even in a few instances vomited before the morphine had been given. The entrance into the dog room of the person conducting the experiment was in most cases sufficient to precipitate this copious salivation. The sight of a hypodermic syringe never failed to produce a secretion of saliva, which continued for a variable length of time, occasionally for several hours providing distractions, such as feeding, did not occur, or the reaction stopped by the narcosis produced by the subsequent administration of morphine.

"If this salivation is secondary to nausea, it might be suspected that in this condition the ability to swallow was impaired. That this cannot be the case is evidenced by the fact that the dogs were observed to drink and on a few occasions to eat during this period of salivation.

"Pain cannot be a factor since morphine itself is the most powerful of analgesic agents. Furthermore, fear was never at any time evident in these animals.

"Eight dogs have been observed in this study of chronic morphinism and all have developed this phenomenon after seven or eight days. One cat has developed a similar condition after fourteen days, differing from the dog only in the ease with which the reflex is established. Three of these dogs have been receiving morphine daily for a period of four months and at the time of the present writing still salivate at the sight of a hypodermic syringe."

---

[62] Collins, K. H. and A. L. Tatum.—A conditioned salivary reflex established by chronic morphine poisoning. Amer. Jour. of Phys. Sep. 1925. Vol. 74. No. 1. pp. 14-15.

N. Sysak—1925.[63]

The author gives in detail the postmortem findings and clinical history of two cases of poisoning from morphin; one a case of acute poisoning and the other of chronic poisoning following six years' use of the drug. He sums up these findings and discusses them as follows:

"We have before us, therefore, two cases of death from morphin poisoning—one from acute and the other from chronic poisoning. The first case concerns a young patient, who took a rather large quantity of morphin 1½ days before death and succumbed to this poisoning. The autopsy revealed in addition to old cirrhotic tuberculosis of the lungs: central necroses in the liver; moderate fatty degeneration, fairly abundant glycogen as well as infiltrates in the periportal connective tissue; also fatty degeneration and moderate hyperemia of the kidneys; adrenals rich in lipoid; fatty degeneration of the heart as well as hemorrhages and ecchymoses in the leptomeninx, pleura, epicardium, and spleen. The case displayed, therefore, two processes alongside each other: an old tubercular pulmonary process, which had almost healed and a new process consequent upon the poisoning. The second case concerned an older man, who had been giving himself morphin injections for six years, finally developed skin abscesses and general oedema, and died of marasmus. The findings at the autopsy were: indurated dermatitis in connection with abscess scars of various ages along with abscesses of the skin; general anemia and oedema of the lower extremities; amyloidosis of the kidneys, liver, and spleen; glycogen in the liver and kidneys; hemosiderosis of the parenchymatous organs and spermato-angitis fibrosa. The man died of marasmus following a skin infection, connected with the chronic morphinism.

"The alterations in the *first* case agree completely with those seen in acute yellow liver atrophy and in poisoning with phosphorus, chloroform, and mushrooms. The fatty degeneration of the liver as well as of other organs, such as the kidney, the heart, is distinct evidence that in morphin poisoning we have an alteration of the total metabolism in the sense of a lipemia, the morphological expression of which manifests itself in the fatty degeneration of the Kupffer's stellate cells. The fatty degeneration of the liver in my case was not extreme, yet moderately abundant; in particular, the regions about the periportal connective tissues showed infiltrates of only a few small marginal drops of fat. In this connection we must remember that the fatty degeneration of the liver was considerably advanced by the cirrhotic pulmonary tuberculosis, which, as is known, always induces fatty degeneration of the liver. For this reason the extreme fatty degeneration of the liver which, according to the statement of many authors, is supposed to be a characteristic diagnostic symptom of acute yellow atrophy of the liver, cannot be adduced as shown by the findings in this case, as the differential diagnosis of poisonings as against acute yellow atrophy of the liver. We may leave undecided the question as to whether the fatty degeneration in connection with poisoning is to be referred to diminished resorption of nutriment (Salvioli and Sachetto) or to the hindering of the synthetic function of the hepatic cells through disturbances of the oxidation process in particular, or to the activation of lipolytic ferments which, having been thrown into the circulation, bring about the mobilization of fat in the tissues. In my case the lipoids in the adrenals were also augmented, a condition observed also by Landau in acute yellow atrophy of the liver. I might mention, as a noteworthy finding, the fairly abundant glycogen in the hepatic cells which were still well preserved. This finding contradicts the generally prevailing view that liver glycogen is strongly affected and, in fact, diminished by poisons, such as phosphorus, arsenic, sublimate, morphin, and others. This diminution is supposed to be the result of irritation of the sympathetic system either by the poisons directly or by asphyctic action, and either from the central sugar center or from its peripheral nerves and those situated in the liver. The fatty degeneration of the liver associated with poisoning has also been connected with the alleged diminution of glycogen, and many investigators—Rosenfeld among others—have spoken of an antagonism between fat and the storing of glycogen. But Lubarsch has shown that the theory of antagonism is scarcely applicable to the liver. Gierke, on the contrary, has spoken of the parallelism in the deposition of both substances. The findings in this case as well as my investigations among children show that we may not speak of antagonism between fat and the deposition of glycogen, and that glycogen may be found in abundance also in connection with poisoning. There is nothing astonishing in the fact that other investigators came upon different findings if we remember that even under physiological conditions the glycogen content of the liver may vary considerably with the nutrition and previous activity. The picture becomes still more diversified when post-mortem and other circumstances are added. This glycogen finding agrees also with the facts established in animal experiments by Seegen, according to which the formation of sugar in the liver is not affected by the morphin narcosis.

---

[63] Sysak, N.—Zur Frage der pathologisch-anatomischen Veränderungen bei akuter und chronischer Morphiumvergiftung. Virchow's Archiv. f. pathol. Anatomie u. Physiologie. 1925. Vol. 254. pp. 163-73.

"The necrosis of the hepatic cells was still in an early stage in my case: there were, moreover, no signs of regeneration or reparation. This finding shows clearly that with morphin just as with other kinds of poisoning the necrosis—i.e., increased decomposition of the cellular albumin—occurs during life. Krontowski and Jacobi succeeded in demonstrating this increased decomposition of albumin under the influence of various poisons *in vitro,* while Freund observed in animal experiments a very considerable increase in the excretion of nitrogen under the influence of large doses of morphin. It seems worthy of note that the necrosis was already present 1½ days after the poison had been taken, whereas in poisoning with phosphorus it generally does not appear until later—after 4-7 days, according to Cornil and Brault—and that its location was centro-acinous. From the last comprehensive work by Herxheimer on acute yellow atrophy of the liver and related lesions, we know that necrosis in the liver characterizes not only acute yellow atrophy of the liver, but also poisoning with chloroform, phosphorus, Amanita phalloides; its location, however, is not the same for all diseases. In poisoning with phosphorus it may vary. Reñz, Ranvier, Cornil and Brault, among others, have seen it in the periphery; d'Amore Falcone, Krönig, in the center. In poisoning with chloroform as well as with Amanita phalloides the centro-acinous region is favored. In acute yellow atrophy of the liver there is no typical seat of the beginning in the acinus, and it varies greatly in individual cases. Zenker, Hirschberg, Kretz, Paltauf, among others, consider the centro-acinous location typical, while Eppinger, MacCallum, Hlava, Kimura, Marchand, among others, give the peripheral as the typical location.

"In general, therefore, the necroses seem to have a certain preference for the center of the acini. According to Herxheimer, the location in the acinus is determined by the initial form of the process—i.e., whether it begins with fatty degeneration or with cell destruction; also, by the quantity of the noxious substance. For this reason he warns against considering the location in the acinus a diagnostic differentiation between poisonings and genuine liver atrophy, as many investigators have done.

"In the characteristic picture of my case are to be included also the hemorrhages of varying degree in the pleura, endocardium, leptomeninx, and spleen, which are probably to be attributed to the vascular lesion caused by the poison, like those found in connection with many kinds of poisoning, as phosphorus, chloroform, as well as in connection with acute yellow atrophy of the liver.

"The second case, which concerns a chronic morphinist, also displays serious somatic lesions resulting from the chronic use of morphin and the abscesses caused by the injections. Four facts give evidence of this: 1) the amyloidosis of the spleen, liver, kidneys, and adrenals; 2) the iron pigment found in abundance in the liver, spleen, and testicles, and, less abundantly, in the kidneys and adrenals; 3) the atrophy of the testicles with constriction of the seminal tubules and thickening of their wall; 4) the finding of glycogen granules in the liver and kidneys. As for the amyloidosis, we know that this finding indicates extensive decomposition of albumen. Lubarsch and Czerny see the essential cause of amyloidosis in nuclear decay conditioned by the primary disease, as a result of which certain albuminous bodies come into the circulation. According to investigations made by Leupold, amyloid is formed in connection with extreme cellular decay, comes later into the blood, and is then supposedly thrown out in the organs through the sulphuric acid, which has not been got rid of because the tissues suffering from amyloid degeneration are incapable of acting. The hemosiderosis in this case is also characteristic of the metabolic disturbances going on in the organism. As is well known, iron pigment is deposited in the organs in many cases when there is intense albumen decay, as Lubarsch has shown in connection with nutritive disturbances in infants and hunger oedemas. Besides, Huebschmann, Stefani, and I have seen such findings mostly in connection with chronic nutritive disturbances in children who were dying of atrophy. Intense atrophy of the panniculus adiposus and diminution of the physiological fat in the parenchymatous organs of this case give further support to the aforementioned assumption of a serious metabolic disturbance.

"The finding of glycogen in the nuclei of the hepatic cells as well as of the renal epithelia is interesting. According to Huebschmann, the cause of the appearance of glycogen granules must be sought in the failure of the protoplasm to do its part in relation to the carbohydrate metabolism. In the course of the disease intense degeneration of the liver has developed in places; in my case this manifested itself in inflated nuclei, containing almost no chromatin, as well as in atrophy of the cells. More, therefore, must have been demanded of the other cells, and since the noxious cause continued its activity, they lost their power of storing glycogen. This deficiency was partly compensated for by storage in the nuclei. For in the opinion of many investigators, it seems possible for part of the metabolic processes, normally consummated in the protoplasm, to be accomplished in the nucleus, when the protoplasm fails.

"Hildebrandt's experiments on rats have shown that chronic administration of morphin interrupts the mechanism of metabolism in some form or another. The experiments established the following: chronic morphin doses produce at the beginning of the experiment a retardation of metabolism in the animal organism; in the final stage, however—after about four weeks—there always occurred suddenly a rapid loss of weight: the animals became cachectic and at the same time the metabolism rose quite considerably above normal. Schuebel's experiments on dogs likewise have shown that the addiction of animals to morphin causes increased excretion of phosphoric acid, purin bases, and fat, and these facts justify the assumption that continued incorporation of morphin produces increased decay of nuclein substances as well as of the fat cells, manifested in the decrease of the body weight. There is not the slightest doubt, however, that not only the chronic morphin poisoning, but also the abscesses which the injections had been causing for a long time, and the chronic inflammation of the skin must be held responsible for the metabolic disturbances which were among the findings of this case; the amyloidosis, in particular, must be ascribed chiefly to the latter process, as its occurrence in connection with morphinism is not known in the literature, whereas it has been observed very frequently in connection with long-continued abscess formation in the skin.

"Likewise, the finding of spermato-angitis obliterans which explains the clinical observation of impotence in morphinists, gives clear evidence that morphin poisoning acts injuriously not only on the brain centers, but also on the sexual organs, as happens also in poisoning with alcohol, iodide of potassium (Adler), in tuberculosis and lues (Kaufmann), and in X-ray irradiation (Herxheimer-Hoffmann). According to Herxheimer and Adler, the poisons produce in the first place vacuolar segmentation, caryolysis of the spermatids and spermatocytes, and finally, the desquamation of the epithelium into the lumen, which results in the thickening of the basal membrane, constriction of the tubules, and proliferation of the connective tissue.

"Thus we see that morphin acts injuriously on many organs, and that this injury manifests itself not only in clinical symptoms but also in pathologic-anatomic alterations. It is difficult to say whether this effect is to be ascribed, as Rost conjectures, to the phenol hydroxyl group in morphin, since the nature of chronic morphinism has not yet been explained. It is also difficult to determine in what way the lesion of the individual organs is produced. The poison might act directly on the cells—and the state of the organs in this case would speak for that—or it might act by way of the nerves—a view vigorously supported by many investigators (Freund, Laubender), especially with regard to the metabolic disturbances in connection with morphin poisoning—or again, through injury of the endocrine organs and the disturbance of their endocrine activity.

"There has been as yet but little investigation of the pathologic-anatomic alterations in connection with acute morphin poisoning. The findings are mostly macroscopic with but little regard for histology. For this reason we find in manuals of toxicology, of legal medicine, etc., only generally accepted statements, mostly to the effect that there is nothing especially distinctive in the findings for acute morphin poisoning. The best description of the pathological alterations as yet was given by Falck in 1855; according to him, the cerebral meninges and sinuses are extremely plethoric; occasionally there are hemorrhages in the ventricles and here or there in the brain or under the arachnoid membrane; the pulmonary vessels are overfilled with blood; sometimes there are hemorrhages in the pulmonary tissue, intense plethora of the liver, the kidneys, and other glandular organs. Binz extracted the brains of rabbits, treated them with morphin solution under incubation temperature, and found granulation of the nuclei, whereas the nuclei of the preparations kept in salt remained clear. Saratschow, in experiments on dogs, observed in cases of acute morphin poisoning 'swelling, loss of branches, and vacuolization of the cells in the central nervous system.' Klestadt described in a case of morphin poisoning, which showed marked sugar excretion, a remarkable deposition of glycogen in the epithelia of the convoluted urinary tubules. According to Jaksch, beyond the hyperemia of the brain, the cerebral meninges, and sinuses, there is nothing characteristic. Hoffman, Troeger, and Dittrich make the same assertion.

"For chronic morphinism also there are for the most part only general statements, which refer only to symptoms of marasmus. According to Jaksch, the anatomical findings are marasmus praecox with atrophic disturbances in the hair and teeth, emaciation, and anemia of the organs. According to Kobert, there are observable symptoms of irritation in the intestine, extreme atrophy of the panniculus adiposus and the muscles, cirrhotic alterations of the skin, anemia of all organs, abscesses under the skin, and oedema of the brain. Saratschow found in cases of chronic morphinism in dogs granular degeneration of the cells in the central nervous system. Leuser, on the basis of a case of morphinism which displayed the clinical symptoms of polioencephalitis haemorrhagica inferior, arrived at the assumption that the morphin had caused a lesion of the liver and that this had in turn caused the polioencephalitis.

"The scant statements with regard to the pathologic-anatomic alterations in connection with morphin poisoning are no doubt due to the fact that investigators contented themselves with the macroscopic findings alone, and that for the most part no histological investigation was made. Careful investigation, however, might help to clarify much that is still obscure with regard to the nature of morphinism."

Eleanor M. Scarborough—1926.[64]

In view of the claims of certain observers that thyroid feeding increases the susceptibility of animals to acute morphin poisoning, and the alleged resemblances between chronic morphin poisoning and hypothyroidism, the author reports the findings of certain experiments with rats to which were administered morphin, thyroid, and morphin combined with thyroid. The objects of the experiments and the method, are described in what follows:

"Object of Experiments

"To combine thyroid feeding with chronic morphine poisoning in rats, and to compare the susceptibility of these rats to morphine with that of rats under the same doses of morphine without thyroid feeding, by observing, during life, the influence of morphine, with and without thyroid feeding, on the behavior, body weight and temperature of the rats, and on the condition of the coat. Also, postmortem, to compare the weights of certain organs, and the structure of the thyroid glands.

"Method

"Albino rats at the age of ten to eleven weeks were used for the experiments. The animals were kept on a uniform diet, the appetite being gauged by noting the amount of food left.

"Experiments, five to nine weeks in duration, were carried out on 48 rats (32 males, 16 females), arranged in 12 groups of 4. A group was taken from animals of the same sex, and wherever possible, of the same litter, and consisted of:

"A. A control rat.

"B. A. rat receiving a daily hypodermic injection of morphine sulphate in initial doses of 1 mgm., increasing to 8 to 12 mgm. The initial dose was that found by Macht and Mora to produce a definite effect on behavior, sometimes with after-effects on the day following administration, but always with subsequent complete recovery.

"C. A rat receiving thyroid daily by the mouth. G. W. Carnwick and Company dessicated thyroid was used in doses of 0.025 grams. This dose was approximately 1/5000 of the body weight, a dose which was found by Cameron and Carmichael to diminish the rate of increase of body weight.

"D. A rat receiving both morphine and thyroid in the same doses as B and C.

"During the experiments a record was kept of body weights and of rectal temperatures, and the condition of the coat was noted.

"In the fifth to ninth week of the experiments the animals were killed (one rat, under morphine and thyroid, died during the third week of treatment). Postmortem, the thyroid gland was removed for histological examination; the heart, liver, kidneys and suprarenals were removed, washed free from blood, and weighed: the amount of abdominal and subcutaneous fat was noted."

---

[64] Scarborough, Eleanor M.—The Influence of Thyroid Feeding on Chronic Morphine Poisoning. Journal of Pharmacology and Experimental Therapeutics. Vol. 27. Nos. 5 and 6. June, 1926.

The results in the different groups of animals are given in what follows:

"*Effect of drugs on behavior.* Of the 12 rats which received thyroid only, 9 were more active than the controls. Of the 12 rats receiving morphine only, 5 were quiet, and 7 were sometimes quiet and sometimes nervous and jerky. In the latter condition the animal would cower in the corner of the box, and make sudden, rather purposeless, darting movements, when attempts were made to handle it. Observations were made about a quarter of an hour after the drug injection. In most cases there was a persistent after effect the next morning, similar to the immediate effect but less marked. The nervous animals became tamer again as the drug effect wore off. The effect of an increase in dose was generally most marked on the day of the change, and decreased slightly on subsequent days, indicating the development of tolerance.

"The incidence of nervous and jerky symptoms was accentuated by combining thyroid with morphine administration. Thus of the 11 rats which received thyroid and morphine, 2 were always nervous and jerky, and 9 were sometimes nervous and jerky and sometimes quiet. (The animal which died in the third week of an experiment is omitted from these and the following results.)

"The incidence of a positive Straub sign (i.e., a peculiar stiffening and curling of the tail, the so-called biological test for morphine) was somewhat greater when morphine was given with thyroid. Thus the sign was sometimes present in 11 of the rats under morphine only, and always present in 1. In 3 of the rats under thyroid and morphine the sign was always present, and sometimes present in 8.

"*Condition of coat.* The coats of the control rats were sleek and thick. Under thyroid the coats of 4 rats remained normal, while 8 became rougher (i.e., less sleek). The coats of all the rats under morphine tended to become rough and thin, but this was only well-marked in 2 animals receiving morphine alone, whereas, when thyroid was given with morphine, the coats of 10 rats showed well-marked changes, with loose hair and bald patches in some cases.

"*The appetite,* as compared with the controls, was very slightly impaired in the thyroid fed rats, although these animals appeared to be the most eager for food. The impairment was somewhat more marked in the case of animals receiving morphine, but the amount of food taken by most of the animals seemed ample, even when they were losing weight.

"*The amount of fat.* Large deposits of abdominal and subcutaneous fat were found in 11 control rats, 4 thyroid fed rats and 1 rat under morphine only. This amount was reduced in 1 control, in 8 thyroid fed rats (3 very marked) and in 11 rats under morphine only (3 very marked). Emaciation was most pronounced, however, in the rats under thyroid and morphine in all of which the amount of fat was reduced (10 very markedly).

"*Changes in body weight.* The modification of growth produced by drug administration is indicated by the following average weights throughout the series:

	Controls	Morphine	Thyroid	Thyroid and Morphine
	grams	*grams*	*grams*	*grams*
At commencement	109	107	111	116
At end	163	137	135	126
Difference	+54	+30	+24	+10

"The rate of increase in body weight was diminished in all the treated animals most markedly in the case of the rats under thyroid and morphine. An actual loss of weight occurred in 3 thyroid fed rats, and in 5 rats under thyroid and morphine, but never in an animal under morphine only.

" . . . During the five weeks recorded the morphine treated animals in each group were receiving the same doses.

"*Changes in temperature.* The modifications in temperature following drug administration are indicated by the following figures, which give the average temperature throughout in the fourth week of each experiment.

"Controls	98.8
Morphine	100.1
Thyroid	100.3
Thyroid and morphine	102.5

"The temperature was higher than normal in all the treated animals (with the exception of 2 rats under morphine, and 1 under thyroid). The rise in temperature was more marked in every case under the combined drug treatment.

* * * * *

"*Weights of organs removed post-mortem.* The following table gives the average weights of the heart, liver, kidneys and suprarenals throughout the 12 groups, compared without reference to body weight:

	Heart	Liver	Kidneys	Suprarenals
Control	0.59	7.41	1.48	0.037
Morphine	0.54	6.64	1.31	0.036
Thyroid	0.64	8.48	1.76	0.04
Thyroid and morphine	0.62	6.93	1.65	0.043

"The weights of the suprarenals vary widely even in the control animals. In the case of the other organs the average weight in the morphine rats is low, in the thyroid rats high, and in the thyroid and morphine rats intermediate, being below the control average in the case of the liver only.

"*Changes in the thyroid gland.* Upon macroscopic examination, post-mortem, the glands of those rats which had received thyroid, with or without morphine, appeared smaller and paler pink.

"Microscopic examination of sections, stained with haematoxylin and Biebriech scarlet, showed a condition of diminished activity in the glands of those rats which had received thyroid, with or without morphine, as compared with the glands of control or morphine rats.

"The sections thus formed two groups: (a) the normally active glands from control and morphine rats, and (b) the less active glands from rats which had received thyroid, or thyroid and morphine. The difference in activity was determined with reference to the size and number of vesicles, the type of epithelium, the occurrence of vacuoles in the colloid, etc.

* * * * *

"Summary

"1. Chronic morphine poisoning, when associated with thyroid feeding, is not accompanied by any accentuation of the depressant action of morphine on the central nervous system.

"2. The metabolic effects, produced by combined chronic morphine poisoning and thyroid feeding, are more marked than those produced by either drug alone, and resemble the effects of pronounced hyperthyroidism.

"3. The weights of organs concerned in metabolism are low in chronic morphine poisoning. The combination of chronic morphine poisoning with thyroid feeding tends to check the hypertrophy of these organs which otherwise accompanies thyroid feeding.

"4. Chronic morphine poisoning is not associated with any change in the structure of the thyroid gland."

Eugène Gelma and Max Aron—1926.[65]

The authors state their objectives to be the determination of the influence of substances capable of selective absorption by the nervous system exercised on the evolution of anura with the idea of obtaining indications of the stages of the functional development of the neuraxis. The account of their experiments follows:

"Malonyl urea employed in the form of somniferin in watery solution (20 to 25 drops of somniferin in 100 cc. of water) did not affect in any way the first evolutionary stages of the fecundated eggs of rana temporaria placed in such solution. Segmentation blastolysis and gastrulation proceeded normally. But when the embryos attained a length of 6mm. to 6½ mm. the development stopped. If the embryos are quickly enough placed in plain water they are able to continue their evolution. If not, they die rapidly without passing the stage which we have just mentioned.

"This fact appears to signify that the acquisition, by the elements of the embryonic nervous system of anura, of their definite physicochemical characteristics occurs at the period marked by the narcosis of the tadpoles. Further, it is at the stage where histologic examination of the neural tube shows the first signs of the differentiation of the neuron. Spontaneous movements appear at the same stage. All evidence indicates that the physicochemical evolution of the nerve cells, which makes them sensitive to the action of somniferin, is dependent on their morphologic and functional evolution.

---

[65] Gelma, Eugène and Max Aron—Action comparée de la morphine et de la malonylurée sur le développement des larves d'anoures. Compt. rend. d. séances de la Soc. de biol. July 9, 1926. Vol. 95. p. 696.

"We wondered if morphin, by reason of the affinity for the nervous system which is attributed to it at least in the higher vertebrates, would show in anura effects comparable to those of malonyl urea. This is not the case. In weak solutions of morphin (½ cgr. per 100 cc. of water) development remains normal for the great majority of experimental embryos, also during the first stages of ontogenesis, until after the appearance of movements. In more concentrated solutions (1 to 10 cgr. to 100 cc. of water) death of the very young embryos takes place more or less quickly. Tadpoles further advanced in evolution sometimes suffer the same fate, but their resistance seems to increase with age. Variations, however, are noted, for the same concentration of morphin in the length of survival of different lots of embryos. However, these findings warrant the hypothesis that morphin acts as a general poison on the embryos of anura without any specific effect upon nerve tissue.

"It will be remembered that Overton, with a different object from ours, studied the influence of morphin on tadpoles, making no note, however, of the stages which preceded the differentiation of neurons. He concluded, as have we, that morphin penetrates these animals slowly and that they resist its action even in very strong concentrations. The same author, on the other hand, administered strychnin to embryos of all ages and noted results which agreed in some measure with those which somniferin gave us; harmless in the first stages of ontogenesis, strychnin did not give evidence of its action until the embryos had reached a length of about 9 mm. It then caused paralysis comparable, Overton says, to that caused by curare. It seems well to point out that the manifestations of the elective influence of strychnin show themselves definitely later than do those of malonyl urea and we are thus shown through pharmacological methods a means of obtaining definite indications on the development of the functional stages in anura of different elements of the neuromuscular system."

S. Nishigishi—1926.[66]

After a study of the basal metabolism of fourteen morphinists, five opium addicts, and two pantoponscopolaminists, the author arrives at the following conclusions:

---

[66] Nishigishi, S.—Studien über das Morphinismus. I. Mitteilung. Grundumsatz der Morphinisten, Opiumisten und Pantoponscopolaministen. Jour. Oriental Med. 1926. Vol. 5. p. 64. Also Studien über den Morphinismus. 2. Mitteilung. Blutchemie der Morphinisten. Jour. Oriental Med. 1926. Vol. 5. p. 69.

"1. The basal metabolism of normal Japanese and Chinese varies about ten per cent from the average value of Aub and DuBois.

"2. The basal metabolism of morphinists, opium addicts, and pantoponscopolaminists generally shows a normal value during the period of addiction.

"3. This basal metabolism is not influenced by either the length of time of addiction or the amount of the customary dose, but depends on the condition of the addict in regard to nutrition, that is, it behaves as in normal subjects.

"4. The basal metabolism of these morbid individuals rises considerably during the period of abstinence.

"5. The condition of nutrition is influenced in these morbid individuals by dietetic conditions and mode of life and increase of metabolism during the period of abstinence, but not by the length of the time of addiction and the amount of the customary dose.

"6. Increase of basal metabolism during the period of abstinence directs suspicion, besides the disturbance of the smooth muscles, for instance those of the digestive canal, to the question of functional anomaly in the organs of internal secretion."

In the same volume of the Journal of Oriental Medicine, Nishigishi reports in a second paper on certain studies of the blood chemistry of morphinists, his object being a further study of the pathogenesis of the condition. Six cases were included, one Chinese and five Koreans. His conclusions follow:

"1. During the period of abstinence the residual nitrogen and urea nitrogen in the blood was normal in amount, the carbonic acid in the blood plasma slightly diminished, and the acetone bodies in the blood greatly increased but within normal limits: the lactic acid of the blood was in excess.

"2. The increase of lactic acid in the blood during the abstinence period is certainly due to the defective combustion of carbohydrates originating in a systemic deficiency of oxygen from the sudden increase of metabolism caused by abstinence.

"3. These anomalies of carbohydrate metabolism inevitably lead to insufficient oxidation of fat and consequent increase of acetone bodies.

"4. The increase of lactic acid and of acetone bodies is manifestly the cause of the diminution of carbonic acid in the blood plasma.

"5. A review of the experimental studies of animals of various investigators regarding functional increase of the thyroid gland and of the facts established by the writer respecting increased metabolism during the period of abstinence renders it highly probable that the increase of lactic acid and acetone bodies during the period of abstinence is referable to an enormous increase in thyroid function.

"6. During the period of addiction the carbonic acid increases slightly in comparison with the period of abstinence, and the lactic acid and acetone bodies fall to their normal amount, while the quantities of residual nitrogen and urea nitrogen remain normal.

"7. The amount of serum albumen remains unchanged during both periods."

Ernst Joël and Fritz Fränkel—1926.[67]

In this, the second of a series of three articles dealing with the pathology of addiction, the authors seek to distinguish between habit and habituation from both the somatic and psychic points of view. In the preceding article they discussed the mechanism of acquired immunity to poisons and emphasized the fact that without exception habituation to poison implies not complete but only partial increase of tolerance, which explains why the process of habituation, which in itself seems purposeful, is nevertheless something morbid bringing a disharmony to the organism; while some organs are less harmfully affected, others are affected to a great degree, often in an increasing degree.

If the poisons are of the euphoric or narcotic order, e.g., those which supply a decided increase of pleasure acting principally on the central nervous system, it is difficult to draw conclusions as to the reaction. The authors point out that in the case of cocain, habituation in the sense of a gradually acquired tolerance does not exist. This is substantiated by clinical observations with regard to the pharmacological habituation to cocain and also by animal experimentation. For this reason cocainism differs essentially from morphinism. In both cases there is an intensive desire for the drug, a tenacious clinging to the poison, danger of relapse, a habit deeply rooted in the personality. In contrast to morphin there is lacking in the chronic use of cocain an acquired tolerance of the organism which requires increasing doses; equal doses always produce the same physical effects; there is no physical habituation and hence no true weaning, i.e., a sensitization of the organism after an interval in the administration, physical hunger for the poison, and finally real abstinence symptoms when the body reacts with symptoms which are the negative of the effect of the drug.

Whatever new symptoms appear in the picture of cocain poisoning during abstinence can be easily explained as a consequence of the abuse and very often as a return of the *status quo ante*.

The authors continue as follows:

"Numerous new experiments with cocain users, which we have since assembled, enable us to confirm completely our earlier views. Moreover, we have not found in the literature any facts which would gainsay our conception. On the other hand, we have been enabled to grasp even more clearly the significance of a factor to which we did not before call special attention—namely, that when we consider the manner in which poisons which beget a sense of well-being produce their effect, we must take into account not only passionate habits, but also habituation, and particularly, psychic habituation, i.e., increased psychic tolerance.

---

[67] Joël, Ernst and Fritz Fränkel.—Zur Pathologie der Gewöhnung. II. Mitteilung. Über Gewöhnheit and psychische Gewöhnung. Therapie der Gegenwart. February 1926.

"Agreement with regard to these matters is made more difficult by language usage which applies the same word synonymously to two concepts. Just as the word *'Arbeit'* (work) expresses the activity as well as the product of this activity of habituating (disregarding the fact that at times it is altogether efforts as well as the condition which these systematic efforts beget as result, so habituation denotes, on the one hand, the union between a single stimulus and its single effect and, on the other hand, the condition thus brought about of diminished response to the single stimulus. For example, a dog becomes accustomed to morphin (activity of habituation) and as a consequence of this single act of habituation there appears the condition of habituation: he is habituated. In the psychic domain there now appears the complicating factor that the activity, of habituating (disregarding the fact that at times it is altogether ineffective) may have as its consequence not only habituation but also habit. We may define habit as a condition in which stimuli which were originally single and occasional experiences, become a necessity of life. That they are really necessities is not always self-evident; the fact, however, may be quite clearly established in negative fashion through the disclination to give them up. By way of illustration, the necessary character of going a certain way can become apparent only on the occasion of a disturbance which comes from the outside and which is in itself quite unimportant. The essential difference between habituation and habit lies in the fact that the concept of habituation implies diminution of the effect of initially effective stimuli and the necessity of increasing the stimulus, whereas habit does not raise the threshold of the stimulus, but may even be compatible with the efficacy of weaker stimuli. The two concepts have so little interconnection, that passionate habit may occur without habituation, and on the other hand, habituation need not presuppose a habit. Furthermore, it is more likely that habituation may lead to the giving up of habits than to the fixing or maintaining of them.

"Consequently, we should not do as Heilbronner does—i.e., we should not apply the word habituation to the fact that weaker stimuli become effective, but we should rather regard this as a typical effect of habit, 'a driving in' (*Einfahren*), a consequence of practice.

"It is precisely in the cravings for poison that we find a justification for a sharp distinction between somatic and psychic habituation.

"The individual who craves them longs for some sort of sensation: euphoria, comfort, reverie, cheering up, excitement, excess, psychic adventure, mysterious happenings. We know that the poison gives him everything he desires, and even much more. The stage of euphoria may be followed—as in the case of cocain and hashish—by a stage of delirium with persecutory and terrifying hallucinations, so that one is constantly amazed at the willingness of the toxicomaniac to accept the risk of the latter stage into the bargain. We find in such an enjoyment of intoxicants an association of pleasurable and painful experiences, occurring together, in succession, and intermingled. There exists, therefore, the possibility that in the course of time the joy will not be sufficiently exhilarating, while the horrors grow less and less terrifying. And such is actually the case. We have known cocainists who would not take the drug after the first persecutory hallucinations. When the recollection paled a little, they took to the drug again; soon the visions no longer seemed so 'awful'; in fact, the thing began to assume a new attraction for them, just as in the case of other things, too, something which at first causes disgust may, after the disgust has vanished, become attractive, until finally a third stage is reached, in which the attraction likewise palls. If a cocainist, after being at first cautious in his dosing, grows bolder—if, in fact, he is now on the scent for every possible experience, painful or pleasurable, we should speak not of habituation merely, but of psychic habituation. The hallucinations have not ceased, but the cocainist has become dulled against their terrors.

"Manifestly, then, increased dosage arising from psychic habituation without preceding somatic habituation is quite understandable. What is termed habituation in the pharmacological sense is somatic habituation.

"We can now distinguish between somatic and psychic habituation to a drug. And that allows for the possibility that psychic habituation may arise from general psychological conditions.

"The delimitation of somatic from psychic increase in tolerance for a drug can be demonstrated with especial clearness by comparing the craving for morphin with the craving for cocain. In the case of morphin it can be shown how a certain psychic need at the beginning can be so satisfied by the administration of the drug that equilibrium, satisfaction, contentment result. If the need remains the same and the dose also, the quantity of the available drug becomes less effective by reason of the somatic habituation (destruction, increased excretion, decreasing sensitivity). And so, when the need remains the same, the quantity administred may have to be increased to make up for the quota claimed by habituation and thereby to restore the balance between demand and supply.

"In cocain a different situation exists. Here, too, there is an initial need which is satisfied by an adequate dose. The body does nothing to diminish the effectiveness of the dose. It may even become more sensitive. If despite that fact, a dulling against initially effective doses does occur, the cause is not in a change of the efficacy of the supply but in a change of the demands, and furthermore—and this alone is the criterion for a true condition of habituation—this change is due not to external influences but to the misuse of the drug itself.

"The somatic or pharmacological habituation in the narrower sense is, therefore, an habituation associated with a need which remains the same. Psychic habituation is habituation through an increasing need.

"From the above relations it becomes evident, likewise, why almost all drug users no longer find satisfaction, after a time, in a single drug. If a morphinist takes to cocain, the fact can be easily understood from the condition of somatic habituation—i.e., he would like to get to something positive over and above the mere abolition of abstinence symptoms. But we have seen often enough that cocainists, despite the euphoria and mental excitement, took to other euphoria-supplying drugs, not because they dreaded the hallucination, but because the entire intoxication-experience and with it the hallucination no longer made any impression, inasmuch as they had become dulled to it.

"This dulling may be as much a symptom of somatic as of psychic habituation. We should call it somatic dulling if a drug—e.g., mescalin—could not, after a time, stir the mind to visions. Should such illusions in another case be associated with psychic effects of the drug, anxiety-effects, for example, and should these grow weaker as the craving develops so that they no longer cause hallucinations, then we should assume psychic habituation.

"Psychic and somatic habituation may, of course, exist alongside each other.

"The compulsive demand for more, the hunger for the drug, has at times been regarded as the sign of a somatic, cellular habituation. But here, too, we must refrain from the assumption of somatic processes so long as an explanation is possible along psychic lines.

"For example, when a doctor finds a therapeutic substance less effective, he increases the dose. A laxative, for example, has to be taken in greater quantity to induce evacuation. The efficacy or lack of efficacy of this remedy, whose point of attack is extracerebral, is recognized by doctor and patient in about the same way, i.e., by its external result alone. The patient himself is a spectator, so to say, except that he is more closely concerned. But when the drug affects the brain, as the intoxicants do, the patient recognizes the effect not indirectly—by a mechanical, peripheral process, so to say—but quite directly. His entire person becomes identified with the effect or lack of effect. The participation of the whole personality explains why increase in tolerance is followed by a direct desire for more, by an increase of the dose. That which, in the case of peripherally-acting drugs, leads to resolution and a definite course of action, becomes in this case, where the personality is at the center of the action, a hunger, a drive, a craving.

"Again, we may explain in what sense the concepts which we have been discussing—somatic habituation, psychic habituation, and habit—are intended to be taken by following the origin and course of a craving for a drug. A morphinist will be strongly attached to his drug in the first period of his abuse (misuse) of it—i.e., so long as he has immediate profit from it. But this attachment is much less an habituation than a habit, since at this time a euphoric effect is still possible without an increase in the dose. This habit will continue to become more passionate; it will lead to an extension of the field of action, in which the slightest impulse provokes the act of intoxication, and the ardent desire for obtaining toxic enjoyment generates a readiness for activity or, as Bleuler calls it, an 'opportune apparatus' (*Gelegenheitsapparat*). Thus, through the might of his habit, the morphinist gradually loses all power of choice as to occasion, and at the same time he becomes more closely attached to his particular drug because as a consequence of the increase of the dose habituation sets in. And with that the original habit loses its significance as regards the craving; by now the evermounting consumption springs from the increasing tolerance and the abstinence-symptoms—the craving for the poison must now be explained as purely physical. And through that the psychic sphere becomes more and more impoverished. If there still exist active tendencies there, then the patient longs for a positive gain, e.g., through cocain, over and above the mere removal of abstinence symptoms. This new poison, to be sure, affords him no somatic tolerance; but, with the return of habit a psychic habituation may perhaps develop, as a result of which the intoxication-experience grows weaker and weaker, existence becomes unendurable, and the drug user is driven to suicide."

Ernst Joël and Alice Ettinger—1926.[68]

In the third article on the pathology of addiction the authors realized that the theories as to the nature of habit, habituation, tolerance, etc., propounded in the preceding article, needed further corroboration, and selected the following as the chief points to be demonstrated:—the dissociation of habituation—not all parts of the body are dulled against the effects of chronically administered poison; many remain positive, e.g., myosis even in the advanced addict to morphin, bradycardia in the addict highly habituated to morphin. This permanence of sensitivity may induce sensitivity, though there may be a partial reversal of the effect. In a morphinist the poison is no longer a sedative, but a stimulant. The excitement caused by morphin in the non-addict has become the chief effect in the addict. The question is, to what extent does this excitement attack extra-psychic points; how far are the withdrawal symptoms the expression of psychic discomfort; how far are they manifestations of physical need; is the fact that the withdrawal is accomplished more slowly than the habituation due to the conditioning of the habituation by euphoria while the withdrawal is checked by dysphoria. Finally, the substitution of other soporific drugs for morphin is difficult in the case of an addict, as has been shown in the case of somnifen. Is there an increased tolerance for these remedies, or is morphin addiction specific and the abstinence symptoms so specific that even large doses of other drugs affect them but slightly?

To demonstrate these matters the authors employed tame white rats weighing about 100 g. These animals were on a mixed diet. The drugs employed were morphin, dicodid and dilaudid, injected under the skin of the back. Approximately 300 rats were used. They described, first, reactions of normal rats to certain stimuli—vocal reaction on pinching, the defense reaction, the flight reaction, the posture reaction, the jump reaction, forced movements, convulsions, the corneal reflex, and total behavior. They then studied these same reactions in acute morphin poisoning with medium doses—5 to 10 mg. —and described the resulting narcotic condition which lasted from two to three days. First the vocal reaction vanishes, then the defense reaction, while the flight reaction is extinguished only by a high degree of narcosis. Exophthalmus develops, the corneal reflex generally becoming negative somewhat later. There is motor deficiency, general repression. They assume a semi-lateral or a flat position not that of normal sleep. The gait becomes uncoordinated, wiry-legged, slinking, mincing.

---

[68] Joël, Ernst and Ettinger, Alice.—Zur Pathologie der Gewöhnung. III. Mitteilung. Experimentelle Studien über Morphingewöhnung. Archiv. für experimentelle Pathologie und Pharmakologie, 1926, Vol. 115, Nos. 5-6, pp. 334-350.

Then follows the stage of excitation with automatic movements, the narcosis and excitation overlapping. Gradually the corneal and defense reactions reappear and the stupor disappears. The excitation manifests itself chiefly in a noisy, heedless, and apparently forced gnawing of the sides of the box while food is avoided. Animals even gnaw at their own paws and other animals until bleeding occurs. This is followed by a particularly energetic defense against painful irritations. This stage lasts from two to three hours and is followed by a third stage, when the animal shows all the signs of ordinary sleep. Twenty-four hours after the beginning of the experiment the animals are tired but react normally.

In the case of large doses—25 to 50 mg.,—the first period lasts longer and may result in convulsions. Doses above 60 mg. are generally fatal. With small doses—1 to 5 mg.—narcosis predominates.

In the following the reactions observed in rats habituated to morphin and morphin derivatives are given in full.

"The fact that in an acute test fatal doses do not have this effect on the habituated organism is regarded as the clearest proof that habituation has been attained. Consequently, the aim of the experiment would have to be to stupefy animals against fatal doses. But the fact that habituation has been accomplished may be recognized not only by the fact that previously unendurable doses have become endurable, but just as much by the fact that previously effective doses have become ineffective. It is just this ineffectiveness that causes the patient to use a larger quantity. The mode of experimental procedure would, therefore, have to be: administration of the drug until, as compared with the initial effect, the drug has lost or diminished its power. The advantage of the first method lies in the distinctness of the issue of the experiment. Nevertheless, the second way seems to have some advantages, too. First, so far as concerns the sharpness of the decision, the disappearance of characteristic symptoms is just as conspicuous as, and at the same time more capable of gradation than, the failure to die. Then, we avoid here two possibilities of error, which are inherent in the first-named method. First, in all experiments for the purpose of habituation, part of the animals die before they have attained the desired immunity. If now the survivors exhibit a slighter degree of mortality or none at all as compared with the controls the result may be due to the fact that during the habituation process there had occurred a natural selection of animals which were originally especially resistant to the drug. This is all the more likely as the individual animals vary from the start in their sensitiveness to morphin. Second, in the course of the experiment, particularly when the higher doses are reached, the animals become sickly, thin, and cachectic. Furthermore, this general debilitation brings factors into the picture of habituation which are hard to appraise. We, therefore, prefer to habituate the animals slowly and only up to medium doses, or we do not attempt any increase in the dose at all, contenting ourselves with determining whether and just how an equal dose causes the original picture of the poisoning to change from day to day.

"Without holding rigidly to a schedule, we generally proceeded in such manner that within 10-12 days we had increased the dose of morphin from 5 mg. to 30 mg. In other experimental series, e.g., with dicodid, we treated individual series with a daily dose of 5 mg. for 2-3 weeks. The difference in the reaction of the non-addicted and the addicted animal is extraordinary. Compare the table on the next page.

"While, therefore, we find in the non-addicted animal disappearance of the voice and defense reactions, lasting for hours, and narcotic symptoms as displayed in the suspension position, cataleptic postures, and the like, the addicted animal begins but a few minutes after the injection to exhibit tic movements, forced gnawing, and other signs of motor unrest, which appear in the non-addicted animal only after a number of hours. It is also at once evident that the total duration of the poisoning is shorter after addiction, and that the addicted animal exhibits again at the end of the experiment his initial behavior, whereas the non-addicted animal is after eight hours still in the second stage. The narcotic stage, therefore, disappears, and there remains the excitation stage. The symptoms of excitation, which originally followed the stupor symptoms as second phase, have been pushed forward to the beginning. In this alteration of the organism there has noticeably come to pass a distinct, but not a complete, dulling against the analgesic effect of morphin. Exophthalmus generally no longer appears.

"When morphin, dicodid, or the like, is administered daily in the same quantity, the habituation process may be directly traced as a curve, as the excitation symptoms set in a little sooner every day, until finally they appear after a few minutes or almost immediately after the injection. Apart from this, they have become, in the course of the chronic poisoning, more violent, even though the dose remains the same. Where they did not occur at all in the non-addicted animal or where there was only a suggestion of them, they now appear in extremely violent

TABLE I

EFFECT OF 10 MG./100 MG. MORPHIN ON THE RAT

	Non-addicted animal								Addicted animal							
	Before inject.	Time after the injection							Before inject.	Time after the injection						
		20 min.	45 min.	2 hrs.	3 hrs.	4 hrs.	5 hrs.	8½ hrs.		20 min.	45 min.	2 hrs.	3 hrs.	4 hrs.	5 hrs.	8½ hrs.
Normal (sitting) position	+	+	—	—	—	—	±	±	+	—	—	—	±	±	±	±
Spontaneous running movements	—	—	—	—	—	—	—	±	—	+	+ +	+ +	+ +	+	+	+
Tempo of running movements when irritated	+	+	+	+	+ +	+ +	+ +	+ +	+	+	+	+ +	+ +	+ +	+ +	±
Abnormal running movement	—	—	+	+	+	+	+	+	—	+	+	+	+	+	+	+
Abnormal leg posture	—	+	+	+	+	+	+	+	—	—	—	—	—	±	±	±
Catalepsy	—	—	—	±	+	—	—	—	—	—	—	—	—	+	—	—
Passive lateral position	—	—	—	+	+	—	—	+	—	—	—	—	—	—	—	±
Suspension position	—	—	+	+	+	—	—	±	—	—	—	—	—	—	—	—
Vocal reaction	+	—	—	—	—	—	—	—	+	—	—	—	+	+	+	+
Defense reaction	+	—	—	—	±	±	+	+	+	+	±	+	+	+	+	+
Disturbed equilibrium	—	—	—	±	±	±	—	—	—	—	—	—	—	—	—	—
Tic-movements	—	—	—	—	±	±	±	+	—	+ +	+ +	+ +	+ +	+	—	—
Forced gnawing	—	—	—	—	+	+	+	+ +	—	+ +	+ +	+ +	+ +	+	—	—
Jump reaction	—	—	—	—	(+)	(+)	(+)	+	+	+	+	+	+	+	+	+
Exophthalmus	—	+	+	+	+	+	+	—	±	+	+	+	+	+	±	±
Corneal reflex	+	±	±	—	—	+	+	+	+	+	+	+	+	+	+	+
General behavior	quiet	lazy	stupefied		partly lively			lazy	lively	excited		lively	excited	lively		lazy

Flight reaction, spontaneous jumping, excitability in response to shock and sound, were without distinction positive in the addicted just as in the non-addicted animal.

form, or can be induced by means of doses which are subliminal (as to effect) for the normal animal. We, therefore, have here not alone the case of a dissociated habituation, but in addition to this, the case of an increase in the symptoms of resistance to the drug. We append a few examples in tabular form.

TABLE II

EFFECT OF MORPHIN ON THE RAT. ± 5 MG. PER 100 G. SUBCUTANEOUSLY

No.	Before addiction			After addiction			
	Narcosis in hours	Excitation in hours	Normal after hours	Duration of addiction in days	Narcosis in hours	Excitation in hours	Normal after hours
1	3	–	6	12	–	4	5
2	3	+	6	12	–	4	5
3	4	(±)	6	12	–	3¾	4
4	3½	(±)	6	12	–	3½	5
5	5	–	6	15	–	4	4½
6	3¾	–	6	15	–	4	4½
7	5	–	6	15	–	4	4½
8	3¾	–	6	15	–	4	4½
9	4½	+	6	15	1	3½	4½
10	4½	–	6	15	–	4	4½
11	3¾	–	6	15	–	4	4½
12	3¾	–	6	15	–	4	4½
13	4	–	6	15	–	4	4½
14	4	2	5	14	–	3¾	3¾
15	2¾	2	5¾	14	–	3¾	3¾
16	2	1½	5¾	14	–	3¾	3¾
17	3¾	1½	5¾	14	1	2¾	3¾
18	3¾	¾	5¾	14	1	2¾	3¾
19	3¾	+	5¾	12	–	3¾	3¾
20	6	+	?	15	–	2½	?
21	2	1½	5	17	–	2½	?
22	3	1½	5½	13	–	2	2¾
23	2	2½	4¾	13	–	2¾	2¾
24	6	+	?	15	–	2¾	?
25	4	2½	?	15	–	2¾	?
26	4½	1	5¾	12	2	1¾	3¾
27	3¼	+	5¾	12	–	3¾	3¾
28	4½	1	5¾	12	–	3¾	3¾

"In view of these conditions, the question arises as to how habituated animals behave with reference to normally fatal doses of morphin. In the case of moderately habituated animals, in accord with what we have just related, we generally encounter a situation which at first surprises us—namely, that they succumb, amid convulsions, sooner than the controls. Along with the excitation, which is unretarded by a preliminary narcotic stage, there is induced a greater readiness to go into convulsions. But when the animals have reached a relatively high degree or long period of addiction, they finally also acquire resistance to fatal doses. It is noteworthy in this connection that the motor unrest, the tic movements, and the like, cannot be eliminated, but that in such cases rather, they are occasionally to be seen even 24 hours after the injection. Absolute freedom from symptoms is never attained, not even after a very lengthy preliminary treatment.

The Specificity of Habituation

"The results of the habituation experiments paved the way for the investigation of the specificity of morphin habituation in rats. The resistance to the narcotic action led us to ask whether other narcotics or hypnotics would still be effective; the susceptibility, the acquired sensitiveness to the stimulating effect might perhaps be referable also to other stimulants. The third thing to be investigated was whether the morphin-habituated animal behaved exactly the same or quite differently with reference to chemically related substances of the morphin group—first the effect of the drugs to be investigated was determined through preliminary experiments.

a. *Hypnotics*

"*Chloral hydrate.* 15 mg./100 g. rat causes a narcotic condition, in which a passive dorsal position is not corrected.

"It appeared that five morphin-habituated animals reacted in the same way as normal animals. They fell asleep just as quickly; the soundness of their sleep (measured by acoustic or tactile rousing stimuli) and the duration were about the same as in the case of the controls. The following is an example:

Normal animal

White rat, weight 130 g., 15 mg./100 g. Chloral hydrate

11:03 Injection

11:15 Passive dorsal position +. Respiration jerky. In response to a slight irritation, correction and normal (sitting) position. Vocal reaction +. Motions hesitant.

11:22 Remains for a long time in passive dorsal position.

11:45 Passive lateral position +. Pinching the tail brings vocal reaction and upright position.

12:25 When irritated, wakes up, runs about.

1:15 Normal (sitting) position, slow motions. Passive dorsal position —. Vocal reaction +. Defense posture +.

Morphinized animal

White rat, weight 145 g., 15 mg./100 g. Chloral hydrate

11:02 Injection

11:12 Spontaneous lateral position. When irritated, moves with utmost difficulty and much vacillation.

11:22 Spontaneous lateral position.

11:39 Completely atonic. Passive lateral position +. Vocal reaction —.

12:28 When irritated, wakes up. Runs with much staggering.

1:15 Lively defense. Passive dorsal position —. Vocal reaction +.

"*Amylene hydrate.* Four experiments with amylene hydrate gave similar results. In the case of this drug, too, the dose chosen was such that there was but small claim for any original resistance to sleep. With 50 mg./100 g. of amylene hydrate, the main symptoms of narcosis are over in normal animals in about 3 hours.

"The result was that the morphinized animals passed into a narcotic stage just as the normal animals, but the severity of the disturbances as well as their duration were rather greater in the morphinized animals.

"*Luminal.* For luminal sodium we used a dose of 12 mg./100 g. The effect begins to show itself after 20 minutes; the maximum soundness of sleep is over after about 3-4 hours, but even after 6 hours disturbances of equilibrium are still discernible.

"Four morphinized animals were compared with three controls. Both groups fell asleep at the same time, suffered the same disturbances of coordination; the soundness of the sleep was about the same in all animals. Six hours after the injection the poisoning was practically over. Here, too, the controls now displayed lighter disturbances of equilibrium and a greater inclination for running than the morphinized animals. It follows, therefore, that the latter, too, are at the very least just as ready for narcosis as the controls.

"The results of our investigations with three differently constituted hypnotics showed that the morphin-habituated organism is, on the whole, not at all resistant to central narcosis, but that it has lost the narcotic reaction to the drug to which it is habituated.

b. *Stimulants*

"For the following experiments the respective drugs were used in doses not large enough to induce convulsions, because in the morphinized rats there might be a greater readiness for excitation. The drugs employed differed as to point of attack and species.

"*Picrotoxin,* administered in a dose of 0.2 mg./100 g., produced no convulsions in the normal animal. The chief symptom during the first hour is a heavily pulsating tremor, which, if it is not visible without further ceremony, manifests itself when the animals are forced to balance themselves on the edge of a box.

"Three morphinized rats, after a dose of 0 2 mg. of picrotoxin, showed exactly the same behavior as the control animals.

"*Strychnin,* 0.1 mg./100 g. causes in the normal rat a distinct augmentation of the reflexes. Excitability in response to sound or shock is increased. Since the results were at first not quite uniform, 15 animals, habituated to morphin, dicodid, or dilaudid, were experimented upon altogether. Result: here too, there was agreement in the behavior of the habituated and the unhabituated animals; in no case was there a sensitization of the morphinized rats to the effects of strychnin.

"Another stimulant investigated was *cocain.* To a dose of 5-10 mg./100 g. the normal animal reacts after about 30-45 minutes with general restlessness, sexual excitation symptoms, pugnacity lasting for hours—in short, with an excitation state of quite a different sort from that produced by morphin. Observation of six animals habituated to morphin and seven to dicodid proved that they, too, exhibited the typical cocain excitation; the morphin excitation, therefore, can be produced only by this alkaloid itself. There were no differences as regards the commencement and duration of the effect.

c. *Morphin derivatives*

"If then, the experiments made so far indicate specificity of morphin habituation, the degree of specificity had now to be determined more precisely. If the degree was very high, one might expect that preliminary treatment with morphin produced dulling against morphin alone; therefore the morphin derivatives which were to be tested presented something new and hence, efficacious. The drugs used were eukodal, dilaudid, dicodid, and codein.

"*Eukodal.* If we disregard questions as to dose, we find in regard to eukodal an almost complete agreement with the diphasic picture of morphin poisoning. The dose was 2 mg./100 g. The average reaction to the dose is presented in tabular form.

TABLE III

BEHAVIOR OF FIVE RATS UNDER THE FIRST DOSE OF 2 MG. EUKODAL /100 G.

No.	Weight of rat in g.	Duration of		Remarks
		Narcosis in hours	Excitation in hours	
1	90	3¼	?	Not observed to the end
2	95	3	+	
3	120	3	−	
4	90	4	−	
5	80	2	2	

"For the five morphinized animals 2 mg. of eukodal had lost their narcotizing effect. The animals presented only an excitation stage of about 2-4 hours, which was quite similar to the picture of morphin excitation in a morphin-habituated animal. A difference was displayed in the fact that in the case of a dose of eukodal which was equivalent to a dose of morphin with regard to the duration of the narcosis, the animals, in antithesis to their behavior under morphin, gave no vocal reaction and repeatedly assumed a spontaneous lateral position.

"*Dilaudid* (Dihydromorphinon). The picture of acute poisoning with dilaudid was likewise almost identical with that presented by morphin poisoning. As a rule, 2 mg./100 g. have a 2-4 hour narcotic effect. Generally, even with this dose, there followed a stage of excitation. In the morphinized animals (six experiments) in antithesis to the control animals, this dose did not produce narcosis, but did produce a condition of excitation for about four hours with forced motions and attacks of gnawing. During the excitation three animals exhibited in the intervals a certain stupor, which did not occur under morphin.

"*Dicodid* (Hydrocodeinon). To a dose of 5-10 mg./100 g. dicodid, which in its acute effect corresponds to about 2 mg. dilaudid, five morphinized rats reacted with excitation only, and in such manner that their condition was exactly similar to that after morphin.

"The similarity of the effect of dicodid and morphin on morphin-habituated animals was so complete that even with the most careful observation it would have been impossible to decide what the animals had received.

"Tests with *codein* passed off in the same way. 15 mg./100 g. usually results in a distinct, but frequently also only in an abortive development of narcosis for about 1½ hours. This is again followed by a stage of excitation analogous to that after morphin. The morphinized animals (four tests) displayed in response to this dose no symptoms of narcosis whatsoever, but only excitation symptoms, as after morphin, even though briefer and weaker.

"Tests with substances chemically related to morphin show, therefore, that these drugs are interchangeable with morphin. The reaction of the habituated rat discloses no differences, or no essential ones; the rat is fortified or sensitized in the manner characterized above also against eukodal, codein, dilaudid, and dicodid. In the case of dilaudid and dicodid, for which according to our conclusions habituation is possible within exactly the same limits as for morphin, we made the further investigation as to whether these relations could be reversed. As a matter of fact, rats habituated to dicodid and dilaudid react to morphin as if the preliminary treatment had been made with morphin.

"The results of the tests as to the specificity of habituation are summarized in the following table.

TABLE IV

No.	Drug	Test dose per 100 g. in mg.	Normal animal	Morphinized animal
1	Chloral hydrate	15	Narcosis (2–3 hrs.)	Narcosis (2–3 hrs.)
2	Amylene hydrate	50	" (3 hrs.)	" (3 hrs.)
3	Luminal	12	" (4 hrs.)	" (4 hrs.)
4	Picrotoxin	0.2	Tremor (1 hr.)	Tremor (1 hr.)
5	Strychnin	0.1	Augmented reflex-excitability	Augmented reflex-excitability
6	Cocain	5–10	Pugnacity, states of excitation, restlessness	Pugnacity, states of excitation, restlessness
7	Eukodal	2	Narcosis (2–4 hrs.) Excitation (2 hrs.)	No narcosis Excitation (2–3 hrs.)
8	Dilaudid	2	Narcosis (2½ hr.) Excitation	No narcosis Excitation (3–4 hrs.)
9	Dicodid	5	Narcosis (1½ hr.) Excitation (2 hrs.)	No narcosis Excitation (2–3 hrs.)
10	Codein	15	Narcosis (1½–2 hrs.) Excitation	No narcosis Excitation (2–3 hrs.)

Withdrawal and Withdrawal Symptoms

"If habituation means increasing dulling through continuous use of a drug, then withdrawal means the re-sensitizing of an organism to the original effect of the drug. We can, therefore, test how long it takes, after the stopping of the regular administration of the drug, for the animal to react to the test dose in exactly the same manner as the first time. The results showed that the withdrawal took a longer time than the habituation. The alteration, which the organism has suffered through the drug, endures for a surprisingly long time. Even weeks after the withholding of morphin, there was no narcosis after renewed administration, but only excitation, though in weakened form. Table V shows this quite clearly.

TABLE V

12 MG. DICODID. REACTION OF A DICODID-HABITUATED RAT, WHICH HAS NOT HAD ANY FOR 3 WEEKS, AND OF A NORMAL RAT

After the injection		Habituated, but now drug-free animal					Normal animal				
Hrs.	Min.	DR	VR	Motor unrest	SP	CR	DR	VR	Motor unrest	SP	CR
	5	+	—	—	—	+	+	±	—	±	+
	20	—	—	±	+	—	—	—	—	+	—
1	45	±	—	+	±	+	—	—	—	±	—
2	20	+	—	+ +	—	+	—	—	—	—	+
3	00	+	+	+ +	—	+	—	—	+	—	+
3	45	+	+	+ +	—	+	—	—	+	±	+

DR—Defense reaction. VR—vocal reaction. SP—Suspension position. CR—Corneal reflex.

"Even after 30 days of abstinence, animals formerly habituated differ distinctly from those who have had no previous treatment. This fact is all the more remarkable when one considers the fact that the habituation process in rats is recognizable after 3-4 days.

"By abstinence symptoms (withdrawal symptoms) we mean such symptoms as distinguish the chronically drugged animal from the normal one, when it is no longer in the stage of acute poisoning. The behavior of the morphinized animals is now altogether different from that of the normal ones. They are much more lively than the normal animals, often even highly excited and wild, are difficult to get hold of, and are generally irritable; the last is recognizable in, e.g., a greater spontaneous inclination to jump, augmented jump reflex, a more furious defense, and more extended vocal reaction. They are frequently in fighting attitude, and appear to be under greater sexual excitement. We were able, by means of control tests, to exclude the possibility that this condition of increased irritability results from the daily injections as such. Animals which receive daily injections of a physiological salt solution are not so tame, to be sure, as rats which have never been experimented upon; yet they do not exhibit the irritability of morphinized animals; furthermore, this condition can also be induced in rats through a continuous internal administration of opiates. If we define abstinence symptoms as those symptoms which can be banished by means of the very drug, the want of which produced them, then this, too, will hold good for the morphinized rats. To be sure, they become excited upon the renewal of the dosing; but this excitement is altogether different from the irritable excitement of abstinence. Fighting attitude, augmented defense reaction, and vocal reaction disappear; the animals pay much less attention to the world about them, disregard the food which is offered them, and are completely absorbed in their own peculiar movements.

Results

"The rat reacts to morphin and its derivatives with a diphasic picture of poisoning. The narcotic stage is followed by a stage of excitation.

"After habituation this diphasic character disappears. The narcosis is excluded. The excitation now comes about at once; dissociation of habituation. This excitation is more violent than at the beginning; augmentation of the excitation effect.

"The hypnotics chloral hydrate, amylene hydrate, luminal, are no less effective on the chronically morphinized animal than on the normal animal.

"The drugs which induce convulsions or excitement—picrotoxin, strychnin, cocain—do not have a stronger effect on the chronically morphinized animal than on the normal animal.

"The morphin derivatives eukodal, dicodid, dilaudid, and partly also codein, act on the morphin-habituated animal essentially like morphin itself, and are interchangeable with due regard as to dose.

"The rat may be habituated to dicodid and dilaudid.

"Habituation to morphin and its derivatives is achieved considerably more quickly than the withdrawal.

"During abstinence the rat presents typical symptoms, which may be banished by means of morphin (or its derivatives).

Discussion of the results

"These results afford an answer for many of the questions raised in the beginning. Thus the somatic factors in the development and general picture of morphinism can be more sharply distinguished from the psychic factors. If the question is as to how far abstinence symptoms are to be explained as preponderatingly psychic, how far the reversal of the effect in the addict arises from an abnormal craving for stimulation, then we see from our experiments with animals, in which we expressly disregard psychic symptoms, that corresponding alterations make their appearance. Here there has developed an augmentation of the stimulating effect along with a simultaneous resistance to the narcosis. This situation exceeds even that of a dissociation of habituation, as discovered by van Egmond in the chronic morphinizing of the dog, or by Langer in habituation to heroin. Langer emphasizes the fact that the stimulating effect of heroin is induced in the addicted dog by the same dose as in the non-addicted one. Naturally, sensitization may be assumed only when the same dose produces an increase in the stimulation symptoms. Biberfeld's experiments, which were made without regard to this caution, are not convincing. Also, we deem it important that it can be securely established that the withdrawal requires a disproportionately longer time than the habituation. The organism surrenders comparatively slowly an alteration in reaction which it acquired very quickly. Thus, too, the morphinist yields to his original poison even after months of abstinence more easily than before; and probably not merely because he knows or values its effects, not merely because he has made a deliberate decision, but as much because of an extrapsychic biological reaction of the mechanism of which we as yet have no idea whatever.—If Cloetta's rats, after two days' abstinence, died of lethal doses which they tolerated before, the fact does not at all contradict our discoveries, but only confirms what we have already said concerning the relatively easy habituation to convulsant morphin doses. For the clinic of morphinism there is greater practical significance in what we have established as valid for the compass of medium doses.

"The picture of acute poisoning and the alteration of its diphasic course through habituation can be linked with the views put forth by McGuigan and Ross and Tamura. According to these authors, in the process of metabolism a stimulating oxidation product is developed from the paralyzing morphin; only the dissimilarity of the metabolism is responsible for the fact that the mammal reacts with convulsions for large doses only, whereas the frog always presents two stages: narcosis and excitation. As we (in agreement with Rubsamen) have seen, the rat reacts essentially exactly like the frog; the principal difference between the two classes of animals does not hold at all. Yet it might be asked whether the disappearance of the narcotic stage in the morphinized rat and the exclusive appearance of the excitation stage were to be connected with an accelerated oxidation of the morphin in the course of habituation. If the fact that the excitation commences immediately after the injection already contradicts this —even if not forcibly, we furthermore believe that according to more recent experiments made by Joël and Arndts, another interpretation is more likely. The latter showed that the rabbit, which when intact reacts to morphin with paralysis and only after large doses with convulsions, displays excitement and a tendency to convulsions after much smaller doses than were required for the intact animal, when the cerebrum has been removed. They concluded from that and from further tests that the point of attack of the stimulating effect of morphin lies in the midbrain, and that normally the cerebrum has an inhibitory effect on the excitation apparatus. Assuming next that not all nervous systems have an equally great capacity for habituation—we refer to the quite different behavior of the respiratory center and the vagal center under chronic morphin poisoning—van Egmond and van Dongen—it would be quite understandable that only the systems which may be narcotized are capable of habituation[69] and that the excitable systems are incapable; furthermore, that in the non-addicted animal the excitation can break through only after the narcosis has passed off, but that in the addicted animal, in which the point of attack of the narcosis has been functionally excluded, the excitation manifests itself immediately and exclusively. The omission of the narcosis in itself makes apparent an increased stimulation. Moreover, in the normal animal part of the drug is dissipated during the narcotic phase, but with the omission of that phase the entire injection is at the disposal of the excitable systems.

---

[69] Flury (Flury, Arch. f. experiment. Path. u. Pharmakol. 1914. Bd. 64, p. 105) has pointed out, in connection with his investigations of harmalin, that habituation to convulsant drugs in the narrower sense is much rarer than to narcotics.

"After the experimental demonstration that chronic administration of dicodid and dilaudid likewise causes an alteration in the reaction, the corresponding clinical cases of morbid habituations may, without further ceremony, be compared with the conditions existing under morphinism.

"The specificity of morphin habituation, as expressed in the unaltered sensitiveness to hypnotics, appears incompatible with clinical observations. (Compare also Biberfeld's corresponding results with dogs.) Here it must be noted that the resistance of morphin addicts to comparatively high doses of hypnotics, as revealed in the clinic, is observed during the withdrawal—that is, at a time when the patient is generally in a condition of serious psychic alteration. The higher degree of toleration with reference to narcotics, which springs from a condition of increased excitability (cf. the experiments on animals by Gensler) should, naturally, not be confused with a non-specific habituation, which then extends itself also to hypnotics. Decisive experimental conclusions are not yet at hand. Furthermore, it is doubtful whether animal experiments can here contribute to the understanding of clinical phenomena."

S. D. Ludlum and Ellice McDonald—1926.[70]

These authors adopted the "smooth muscle reaction" of the intestinal tract as a means of estimating vagus-sympathetic balance of the vegetative nervous system. The action of morphin was studied in addicted individuals. Their report of findings is included in the following:

" . . . It was found that morphine hunger was a state of increased sympathetic tonus, or sympathetic preponderance with corresponding decrease in the smooth muscle reaction. The method was the twenty-hour roentgen-ray study of the vegetative innervation of the colon and the immediate fluoroscopic observation of the barium meal in the stomach in the absence of other drugs and purgatives. By means of the haustral arrangement and postural tone of the stomach and large intestine, it was possible to determine the effect of morphine and its withdrawal on the vegetative nerve balance.

"This is a method that lends itself readily to the study of drugs, endocrines and salts. The vagus division causes contraction of the haustra and diminished amplitude of the smooth muscle of the gastro-intestinal tract, and the sympathetic division causes increase in the amplitude and enlargement of the haustra. This is well seen in a study of the effects of atropine and physostigmine (eserine) on the intestinal smooth muscle. Atropine, as is well known, is a sympathetic stimulant (or paralyzes the vagus producing sympathetic preponderance), and roentgenograms before and after injection of atropine showed that a dilatation of the large intestine with obliteration of the haustra was produced by atropine. Physostigmine, on the contrary, produces vagus preponderance and it was found by means of roentgenograms before and after injections of physostigmine that contraction of the haustra and diminution of the caliber of the large intestine was produced by it. It was obvious, therefore, that the alterations in the haustral arrangement and postural tone of the smooth muscle of the intestine (which we call the smooth muscle reaction) were nerve (and not local) effects, and that the rhythm, rate and amplitude of the gastro-intestinal tract, as viewed by the roentgen rays, could be taken as an index or criterion of the vagus-sympathetic balance of the vegetative nervous system.

---

[70] Ludlum, S.D. and Ellice McDonald—Morphine hunger and the smooth muscle reaction. A study of the habitué. J.A.M.A. March 20, 1926. Vol. 86. p. 835.

"In the habitué, morphine hunger was marked by dilatation and haustral relaxation of the colon and dilatation of the pupil—a decreased smooth muscle reaction (Figs. 1, 2 and 3)." [71]

* * * * *

"Morphine increases the vagus preponderance of the vegetative nervous system as we have found magnesium and calcium salts to do. It is not surprising, therefore, that Gwathmey has found that there is a synergism between morphine and magnesium sulphate. Both of these substances are in the class of anesthetics that decrease permeability of the cell, as we believe most, if not all, of the vagus stimulants do.

"The necessity of the morphine habitué may, therefore, be spoken of as an alteration of the vegetative nerve balance with sympathetic preponderance which morphine relieves by producing vagus stimulation. The condition is dependent on chemical changes of a colloid character in the bodily equilibrium, and morphine hunger is evidence of a deep physiologic need. The hope of the treatment of the habitué must be, therefore, in the correction of this physiologic or bodily unbalance by means of such substances as will produce the vagus preponderance or correction of the sympathetic preponderance and not produce the anesthetic or pain relieving effects of morphine."

Eaton M. MacKay and Lois L. MacKay—1926.[72]

These authors first report the existence of a marked increased tolerance to morphin in uremic rats after double nephrectomy. They suggest a relationship between the increased morphin tolerance and the adrenal cortex hypertrophy in uremic rats. Further findings are given in what follows:

" . . . Many findings point to a connection between non-specific resistance and the adrenal cortex. In so far as morphine is concerned, we have been able to confirm the observations of Lewis and Scott that tolerance to morphine is

---

[71] Figures contained in the original article have not been reproduced here.

[72] MacKay, Eaton M. and Lois L. MacKay—Resistance to Morphine in Experimental Uremia. Reprinted from the Proceedings of the Society for Experimental Biology and Medicine. 1926. Vol. 24. p. 129.

PLATE III

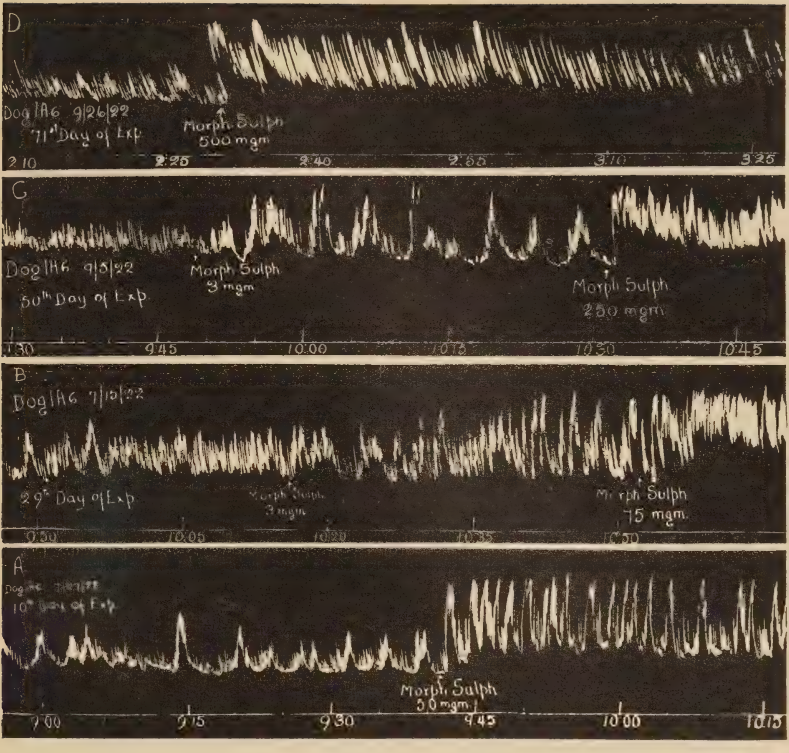


Fig. 1. Experiment I. Daily Administration of Ascending Doses of Morphine for 71 Days

"Dog IA6, weight 20 kgm. Tracings from Thiry-Vella fistula of ileum, with rubber balloon and bellows recorder. Very slow kymograph.

"*Tracing A,* shows the effect of 50 mgm. morphine sulphate on the 10th day of the experiment.

"*Tracing B,* shows the effect of 3 mgm. morphine sulphate followed by 75 mgm. on the 29th day of the experiment.

"*Tracing C,* shows the effect of 3 mgm. morphine sulphate, followed by 250 mgm. on the 50th day of the experiment.

"*Tracing D,* shows the effect of 500 mgm. morphine sulphate on the 71st day of the experiment.

decreased following double adrenalectomy. In addition, we have found that the adrenal cortex hypertrophies when a rat is given increasing doses of morphine. The hypertrophy is greater the larger the tolerance attained."

G. H. Miller and O. H. Plant—1926.[73]

In a previous paper these authors reported "that injections of morphin and other opium alkaloids in unanesthetized dogs produced a marked increase in tone of the intestinal muscles together with an increase in frequency and amplitude of the large tone waves." Their objective in the present study was the determination of the effect of tolerance and withdrawal on the action of morphin as noted in normal dogs. Their experiments and findings are given in the following:

"Two experiments were carried out on dogs with Thiry-Vella fistulae of ileum. In one, a small dose was repeated daily for six weeks, in the other ascending doses were administered daily for a period of ten weeks. Graphic records of intestinal contractions were made by the technique reported in a previous paper by means of a sausage-shaped rubber balloon filled with water, inserted into the fistula and connected with a bellows recorder. In this way records were obtained without anesthesia or operative procedure at the time of the experiment.

"*Experiment I. Ascending doses of morphine sulphate.* Dog IA6, a large female collie, weighing 21 kgm. was used. The dog had recovered completely from the operation at which the fistula was made. It was in excellent condition and of quiet, friendly disposition. Daily hypodermic injections of morphine sulphate were administered for seventy-one days and during this time the dose was increased from 21 mgm. (1 mgm. per kilogram) to 500 mgm. (25 mgm. per kilogram). The dog remained in excellent condition throughout the experiment and lost only 1 kgm. in weight. There was some loss of appetite during the first two weeks, when the dog would refuse food at the regular feeding time, but usually ate most of the food offered before the next injection. There was never any diarrhea; the stools remained hard as they had been before the experiment was started. The stool interval lengthened somewhat as the experiment progressed, but was seldom longer than two days. In the earlier stages, the period of pronounced narcosis lasted four or five hours, but this became shorter as the experiment progressed and eventually the dog did not go to sleep immediately after the injection, although she kept very quiet and moved but little for several hours. Her disposition underwent a marked change after a few weeks—instead of being friendly and demonstrative she became shy and cowering and four to six hours after the injection became nervous, restless and spent much of the time wandering aimlessly about the kennel. Vomiting did not occur until the dose had reached 50 mgm. (2.5 mgm. per kilogram) and ceased at 75 mgm. Salivation was marked from the beginning; when the dose was increased to 150 mgm. the salivation became very marked, great strings of heavy, viscid mucus hanging from her jaws for several hours after the injection. This continued to the end of the experiment.

---

[73] Miller, G.H. and O.H. Plant—Effect of morphine and some other opium alkaloids on the muscular activity of the alimentary canal. II. Influence of continued administration of morphine and of withdrawal on the contractions of small intestines of dogs. J. of Pharm. and Exp. Therapeutics. Aug. 1926. Vol. 28, No. 2. pp. 241-249.

"Records of the intestinal contractions were made at intervals of two to three days throughout the experiment. Figure 1 shows the reaction that followed the injection at various stages, on the 10th, 29th, 50th and 71st days of the experiment.

"These tracings show that the typical reaction to morphine remained throughout the entire period—marked increase in tone and in amplitude and frequency of the peristaltic waves.

"From time to time small doses (0.15 mgm. per kilogram) were injected before the daily dose was given. This amount is near the minimum for producing a distinct reaction and it invariably produced the usual effect, regardless of the size of the daily dose that was then being administered. Such effects are shown in tracings *B* and *C* of figure 1.

"During the withdrawal period there were quite marked changes in the character of the tracing obtained. The amplitude and frequency of the waves was increased, particularly the large tone waves (peristalsis). This is seen in figure 2, where tracings taken on the 1st, 2nd and 6th days of the withdrawal period are shown. All of the tracings were taken at the same time of day and therefore bear the same relationship to food and digestion; all were made with the same balloon and bellows-recorder so that the amplification of the contractions is the same in all.

"On the first day of the withdrawal period, the tracing was taken five hours after the time for the daily injection of morphine and comparison of this tracing (fig. 2, A) with the normal period in tracing *D* of figure 1, which was made on the day previous at the time of the injection, shows that there is a marked increase in the activity of the gut, even at this early stage of the withdrawal period. The increase in activity is even more pronounced on the second day of withdrawal and here the large tone waves are strikingly increased both in frequency and in amplitude (tracing *B*, fig. 2). A similar increase in muscular activity is evident as late as the sixth day of the withdrawal period (tracing *D*, fig. 2). After the sixth day, the tracings obtained from the fistula rapidly returned to normal. During the first three or four days of this period the stools were very soft or fluid.

"The general behavior of the animal also changed during the withdrawal period. The first day she slept almost continuously even while the tracing was being made and was difficult to arouse. Later she became restless and hard to control while on the table; there was marked twitching and jerking of the leg muscles, and during the periods of sleep she barked as though dreaming. After about a week her behavior was normal.

"*Experiment II. Repetition of the same small dose of morphine sulphate.* Dog IA5, a large female collie, weight 23 kgm. The dog had been operated for the formation of a Thiry-Vella fistula of ileum, sixteen weeks before the

PLATE IV

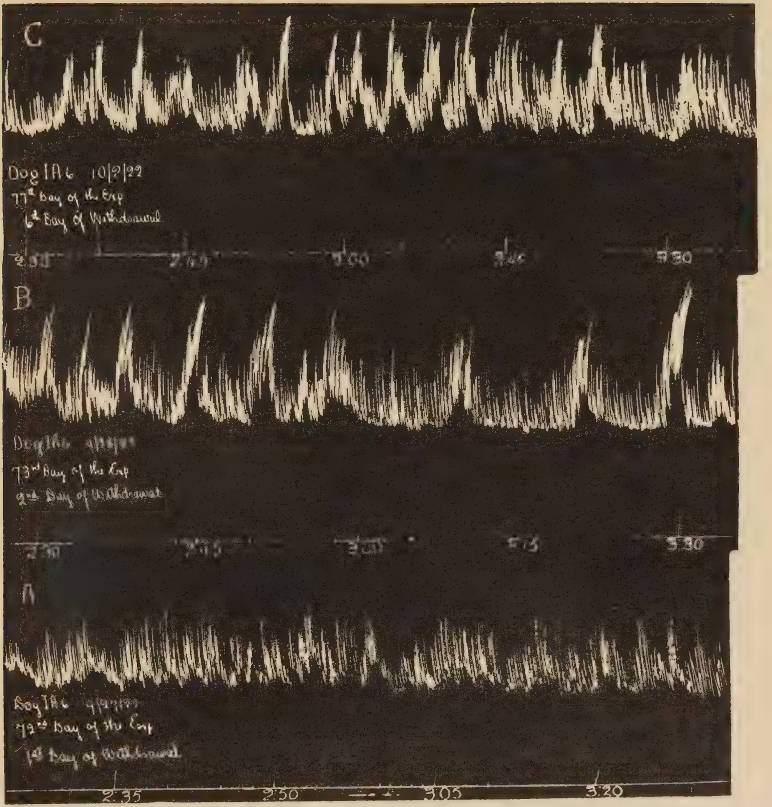


Fig. 2. Experiment I. Intestinal Contractions during Withdrawal of Morphine, after Administration of Daily Ascending Doses for 71 Days.

"Dog IA6. Tracings from Thiry-Vella fistula of ileum with rubber balloon and bellows recorder on slowly moving drum. All the tracings were made at the same time of day and with the same balloon and bellows recorder.

"Tracing A, shows the character of contractions on the 1st day of the withdrawal period (72nd day of the experiment) about 5 hours after the usual hour for injection of the daily dose.

"Tracing B, shows the character of the contractions on the 2nd day of the withdrawal period.

"Tracing C, shows the character of the contractions on the 6th day of the withdrawal period.

PLATE V

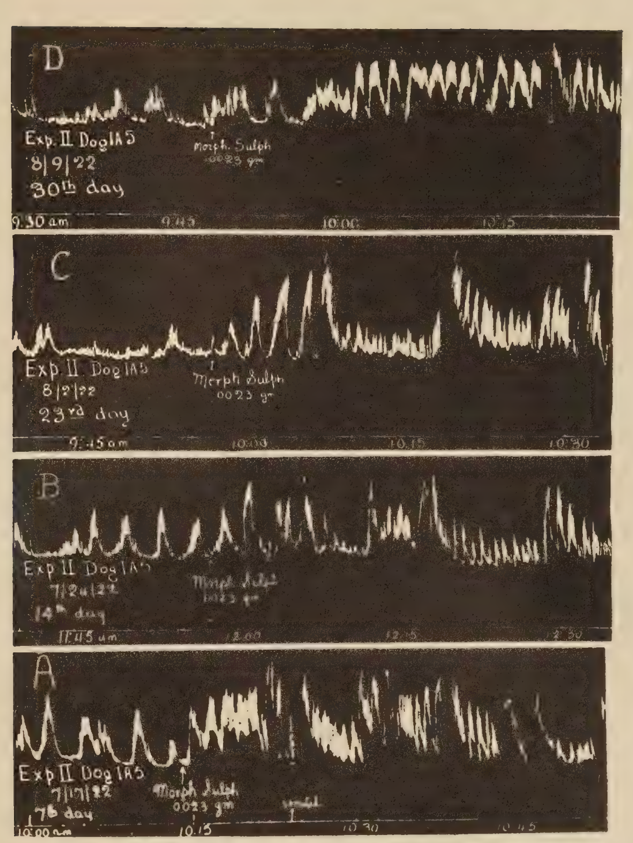


Fig. 3. Experiment II. Daily Repetition of the Same Small Dose (0.1 Mgm. per Kgm.) of Morphine Sulphate for 42 Days

"Dog IA5, weight 23 kgm. Tracings from Thiry-Vella fistula of ileum with rubber balloon and bellows recorder. Very slow kymograph.

"*Tracing A,* shows the effect of the injection on the 7th day of the experiment; *tracing B,* on the 14th day; *tracing C* on the 23rd day and *tracing D* on the 30th day of the experiment.

experiment was begun, and was in excellent condition. The animal had a lively and demonstrative disposition, but was easily trained to lie quietly on the table while tracings were made of the contractions of the ileum.

"Daily injections of 2.3 mgm. morphine sulphate were made for 42 days. Tracings were made from the Thiry-Vella fistula showing the effect of the injection every second or third day during the experiment.

"There was no decrease in the effect of this small dose during the six weeks it was administered. Each injection produced a prompt increase in the muscular activity of the gut, which was as great on the last day of the experiment as at the beginning. In figure 3, are shown the tracings obtained on the 7th, 14th, 23rd and 30th days of the experiment.

"During the first twelve days of the experiment the dog showed some general reactions from the injection; nausea, salivation and on three occasions vomiting; slight narcosis, in that the dog was more quiet and somewhat less responsive for a few hours but did not go to sleep. There was no change in the character or frequency of the stool and the dog ate regularly. There was a moderate loss in weight, amounting to 2.5 kgm. at the end of the experiment. After the 12th day the injections had no apparent effect on the behavior of the animal, all evidences of nausea and of narcosis disappeared.

"When the administration of the drug was stopped there were no obvious changes in the tracing of the intestinal contractions or in the dog's behavior, except that she slept rather more than usual for a few days.

"It has been repeatedly demonstrated that many of the reactions produced by morphine in dogs disappear or are greatly diminished when the dose is repeated over a long period of time—narcosis, vomiting, respiratory effects, etc. Until the work of van Egmond, 1911, was published, it was supposed that tolerance extended to all tissues which show a reaction to the drug. This author showed that the cardiac vagus center does not become tolerant to morphine. In his experiment on a dog the pulse was markedly slowed by the injections even when they had been continued for a period of several months and the dose had been increased to 230 mgm. per kilogram. At this time the vagus center still showed a distinct reaction to much smaller amounts, e.g., 1 mgm. per kilogram.

"Van Egmond also tested the emptying-time of the stomach in his tolerant dog by means of the fluoroscope and bismuth meal and found that while there was some delay in the passage of the food into the duodenum, it was not nearly so great as described by Magnus 1908 in non-tolerant dogs. He concludes, therefore, that the alimentary canal develops only partial tolerance to this drug. These observations were confirmed by Reach, 1914.

"Van Dongen, 1915, studied the development of tolerance by the respiratory center, pupil, vomiting center and cerebrum in two dogs, and found that these organs eventually show complete tolerance, although the time and dosage necessary to produce it varied considerably for the different functions.

"The results of our experiments, which show that tolerance is not developed by the intestinal muscles to the stimulating effect of morphine, parallel the observations of van Egmond on the cardiac vagus center and furnish added evidence that tolerance to this drug is not developed equally by all tissues which react to it.

"In this connection, it is of interest to point out that there can be no direct relationship between these two observations—the failure of the cardiac vagus center and of the intestinal muscles to develop tolerance to morphine—for while the intestines receive motor fibers that run in the trunk of the vagus, we have shown that section and degeneration of the nerve fibers in the mesentery of a loop of intestine increases rather than diminishes its reaction to morphine, and this eliminates any central action of morphine as the source of the intestinal effect.

"Further, these results have a bearing on the cause of morphine tolerance, particularly on the theory advanced by Faust, 1900. He showed that in dogs the amount of morphine in the feces diminishes rapidly and eventually disappears as tolerance develops, and he holds that tolerance is due to increased destruction of the drug in the tissues. The fact that the intestinal reaction to small doses does not diminish after weeks of administration and that very small amounts of the drug are still effective at a time when other structures like the vomiting center and cerebrum fail to react to very large doses, indicate that other factors than increased destruction of the drug by the tissues play an important part in the development of tolerance to it.

SUMMARY

"1. The stimulation of the intestinal muscles by morphine does not disappear when the drug is administered continuously for several weeks. Very small doses continue to produce the reaction after daily administration during six weeks. Small amounts still produce a distinct reaction when ascending doses have been administered for ten weeks.

"2. These results indicate that other factors than increased destruction of the drug by the tissues play an important part in the development of morphine tolerance."

W. Weimann—1926.[74]

The author's findings in three human cases and numerous animal cases of acute and chronic morphin poisoning are given in detail in the following:

"Organic alterations in connection with poisoning through alkaloids generally are very slight, and if present at all, quite unspecific. This holds also for poisoning by morphin and its derivatives, which, along with cocain and strychnin, undoubtedly have the greatest forensic significance of all alkaloids. For morphin poisoning a whole array of repeatedly occurring autopsy findings have been alleged. Yet these are in no way characteristic and, most important, may be altogether wanting.

---

[74] Weimann, W.—Zur pathologischen Anatomie der akuten und chronischen Morphiumvergiftung. Deutsche Ztschr. f.d.ges. gerichtl. Medizin. 1926. Vol. 8. pp. 205-220.

"In *acute morphin poisoning* the most constant finding is hyperemia of the brain and its integuments (Manuals of legal medicine and poisoning). The sinuses of the brain also often display abnormal plethora. There may be an increase of fluid. Brain hemorrhages are comparatively rare (Kobert, Tröger). F. Strassman saw a typical purpura cerebri in a case of acute poisoning; Sysak saw extensive meningeal hemorrhages in a person who died two days after being poisoned. The hyperemia of the brain may also be missing. There was even a case in which a remarkably pale and anemic brain was found (Tröger, Auerbach). Usually the pupils no longer are contracted in the cadaver, but more or less enlarged and abnormal after death. The lungs generally are congested, and frequently oedematous. According to Tröger, there are lung hemorrhages, especially if there were convulsions before death. Generally, dark fluid blood is found in the heart. The abdominal organs are also generally hyperemic. The ecchymoses of the mucous membrane of the stomach, frequently present, are almost always attributable, according to Tröger, to the effect of emetics and stomach-rinsing. Only rarely do the contents of the stomach have a characteristic opium odor. Urinary bladder and lower sections of the intestines are well-filled generally because of the atony of their musculature.

"In *chronic morphin poisoning,* besides the skin abscesses caused by non-sterile injections and their consequences, the most frequent findings are marasmus præcox, general atrophy, and anemia. Often there is also œdema of the brain, lungs, and integuments, rarely symptoms of irritation in the intestine (Manuals of legal medicine and poisoning, Tröger). In addition Tröger mentions thickening of the bronchial or intestinal mucous membrane along with stasis in the lesser circulation (hypertrophy of the right heart, dilatation of the pulmonary artery); Weber—premature arteriosclerosis; Sysak—amyloid liver and kidneys, sago spleen, cardiac callosity.

"All these findings are *not at all characteristic* of morphin poisoning. They may be missing in pronounced cases of poisoning. In acute poisoning they correspond, in general, to the findings for asphyxia, as frequently encountered in the most varied morbid processes. In chronic poisoning they are to be attributed to cachexy, skin infections, or secondary diseases (tuberculosis).

"Thus far *histological findings in the organs* have been but scantily reported for morphin poisoning. From the beginning, special interest has been accorded in animal experiments to brain alterations only. As regards the work in question I have gone into detail elsewhere; I shall limit myself here to a brief summary.

"The investigations all belong to the period around 1900, when interest was limited to the various diseases of the ganglion cells, which were held to be specific for the individual forms of poisoning. As for other alkaloids, so for morphin, there were found very serious alterations of the ganglion cells which, to a certain degree, at any rate, always followed a definite course:—in acute poisoning, tigrolysis, swelling, and homogenization; in sub-acute and chronic poisoning, in part, serious liquefaction processes, vacuolization or contraction of the cells up to complete destruction. Abnormal fatty degeneration of the cells was also observed. Often the cell alterations were very slight, even for prolonged poisoning. In addition, there were mentioned rather frequently hyperemia of the brain-vessels and capillary hemorrhages; for prolonged poisoning, homogenization and thickening of the capillary walls, fatty degeneration of the capillary endothelia, and cellular or liquid exudations in the perivascular lymph spaces. Degeneration of the fibers of the posterior strands of the spinal cord, similar to that in chronic alcoholism (Nonne) was observed by Alt and Schütz.

"It is evident that the investigations made at that time were by no means without result. Nevertheless, the brain alterations figuring prominently in morphin poisoning were not characteristic. They occurred in precisely the same form and intensity in connection with other alkaloids and poisons (lead, Hg, phosphorus, etc.) and since the hope of finding specific ganglion cell alterations for the various kinds of intoxications has been destroyed by Nissl's work, research of this sort has been abandoned completely. It is strange that, with a few exceptions, no investigations of the brain of *chronic morphinists* from modern points of view have been made as yet, with reference to the general histological process and its extension.

"Ewing is the only one who reported, some time ago, brain findings in 3 morphinists, where fatty degeneration, sclerosis, and tigrolysis of the ganglion cells were actually present. Weber, too, observed serious fatty degeneration of the ganglion cells and thickening of the walls of the cortical vessels; and recently Creutzfeldt reported a case of chronic morphinism of several months' duration, terminating in suicide with morphin (and probably veronal), in which in addition to the acute alterations there was present a diffuse fatty degeneration of the cortical cells and brain vessels with distinct cell degeneration in the cortex and increased storing of iron in the striatum.

"Histological findings in *the remaining* organs of the body have hardly been reported as yet.

"Pilliet mentions fatty degeneration of the liver in dogs. Horiuchi observed in animals already seriously cachectic enlargement and hypertrophy of the suprarenal cortex as well as enlargement of the medullary cells. Sysak, in a case of acute poisoning complicated with tuberculosis, observed, first of all, acute yellow liver atrophy with necrosis of the lobular centers, fatty degeneration of the lobular surface, and periportal infiltration, fatty degeneration of the kidneys and the myocardium along with hemorrhages of the spleen; in a case of chronic poisoning, likewise complicated by many secondary morbid processes, an atrophic amyloid liver, amyloidosis with moderate fatty degeneration of the kidneys, fatty degeneration of the adrenals, pancreas, seminal vesicle, a sago spleen with fatty degeneration of the trabeculæ, and hemosiderosis of the parenchymatous organs.

"My investigations have concerned themselves principally with the *central nervous system,* which quite automatically attracts special attention in animal experiments; also because the morbid findings in it for all forms of morphin poisoning dominate the picture, completely overshadowing those in the other organs. A case of *acute poisoning,* which, through the kindness of Professor Spielmeyer I was permitted to investigate at the *Forschungsanstalt für Psychiatrie* in Munich, is the starting point of my investigations.

"A shopkeeper, 26 years old, an unstable and hysterical psychopath, takes about 10 tablets of morphin at 7-8 P.M. At 8 P.M. he vomits; at 8:30 P.M. he becomes dizzy and light-headed. At midnight he was brought unconscious to the Munich Psychiatrical Clinic. Respiration shallow, pin-point pupils; vomiting. After a stomach wash, temporarily regains consciousness. Rapidly grows worse again; increasing loss of consciousness; Cheyne-Stokes respiration; extreme cyanosis. Death ensues 10 hours after poisoning.

"The *autopsy* (2 hours postmortem) revealed distinct brain hyperemia along with older adhesions and clouding of the meninges. In addition there were dilatation and brown atrophy of the heart, recent tracheobronchitis, old pleurisy, and cicatrised apical tuberculosis. All internal organs were highly plethoric; the urinary bladder was well filled. The brain alone was examined microscopically.

"The second case, which I owe to the kindness of Dr. Bratz, Director of the Asylum for the Insane, Berlin-Wittenau, involved *chronic poisoning with laudanum.*

"An editor, 42 years old, administered to himself injections of laudanum in large doses for about ¾ year for chronic intestinal trouble of long standing. During a visit to Berlin, being unable to obtain laudanum he took 10 tablets of adalin. He was brought to the hospital in a state of sound sleep. Here a pronounced condition of psychic deficiency, in addition to uncharacteristic neurological symptoms, was established. Four days after admission the patient suddenly collapsed and died.

"The *autopsy* (22 hours postmortem) revealed as the cause of death a perforated ulcer of the stomach, on account of which the patient had been having hemorrhages for some time, œdema of the lungs, incipient bronchopneumonia, slight atrophy of the spleen, dilatation of the heart, cloudy swelling of the kidneys, increase of lipoids in the suprarenal cortex. The brain was hyperemic and very moist. Ventricle slightly dilated. Microscopic examination of the brain only.

"Another case of *chronic morphinism* I owe to the kindness of Dr. Dyrenfurth, who conducted the legal postmortem.

"Shopkeeper, 26 years old; charity case; heavy morphin abuse for 7 years, after operation for gall-stones. Numerous unsuccessful withdrawal cures in hospitals and asylums for the insane. 15-20 injections daily, according to his mother's statement. One afternoon he came home completely exhausted and slept till next morning. He was found unconscious in bed at 3 o'clock, and died an hour later. Hidden in the armpit was a bottle of morphin solution. The mother assumed suicide with morphin.

"The *autopsy* (4 days postmortem) revealed distinct hyperemia of the brain, lungs, liver, and kidneys, a few infarct-like areas in the lungs. Suprarenal cortex very rich in fat. Intestines very much inflated. Old scarred adhesions in place of the gall-bladder. Arms and legs showing numerous abscess scars and fresh points of injection.

"In addition, numerous rabbits, guinea pigs, and mice were given subcutaneous or intravenous injections of maximal doses of morphin several times each day. Some of the animals were given superlethal doses from which they died in 1-3 hours; others were kept longer under morphin until they either died of themselves or were put to death after 1-16 days of poisoning. The sensitiveness of the animals to the poison varies greatly. Habituation appears even after comparatively brief intoxication. The rabbits under poison for the longest period received altogether up to 5.25 g., the guinea pigs up to 2.04 g., the mice up to 0.1 g. morphin.

Central Nervous System.[75]

"The brain findings in the human cases of poisoning show wide agreement despite the fact that in the one there was acute intoxication and in the other chronic. It is a question of a severe and purely degenerative morbid process, widely spread through the entire brain and most highly pronounced in the cortex. Abnormal fatty degeneration, shrivelling, and honeycomb degeneration of the ganglion cells are most prominent; these have led to the destruction of numerous elements, especially in the third and fifth cortical layers. There is considerable fatty degeneration of the glia cells also and, most important, the walls and especially the endothelia of the brain-vessels contain unusual quantities of lipoid. Along with these there are, in the acute case especially, more acute alterations of the ganglion cells in the form of tigrolysis and swelling of the elements. Most severe are the cell alterations in the forebrain, especially in the cornu Ammonis, while those in the occipital lobe are comparatively slight. Of the deeper brain centers, the striatum is especially affected, but not so intensively by far as the cortex. Further down, the process rapidly decreases, so that the alterations, in the medulla oblongata and spinal cord especially, are comparatively slight. The pia shows slight fibrotic thickening and, especially in the acute case, it is traversed by hemorrhages. Separation of nerve fibres is very slight. The difference in the cases rests chiefly on the differing intensity of the alterations in the ganglion cells. In the chronic cases they are generally more severe and have led partly to a liquefaction of the ganglion elements with extended cell destruction in certain cortical layers. Also, the fatty degeneration of the vessels is here much more intensive than in the acute case. Furthermore, in one of the chronic cases there is a fibrotic degeneration of the cortical vessels, which has also led to the development of infarct-like atrophic areas corresponding to the arteriosclerotic areas. In the acute case there has come about a decided ameboidosis of the glia in the medulla of the hemispheres, which is not found in the chronic cases.

"In the animals the brain lesions vary with the duration of the drugging. In addition, there are certain differences as regards their localization between individual animal species. Here, too, the alterations of the ganglion cells are everywhere in the foreground. In animals subjected to acute poisoning with superlethal doses, which generally died suffering dyspnœa, convulsions, and urine discharge, they are likewise already distinctly pronounced. Essentially it is a case of tigrolysis and swelling of the elements. The brain vessels are regularly richly filled with blood. In animals under poison for a longer period —up to 8 days—the alterations assume very severe forms. The ganglion cells perish under conditions of most severe liquefaction, decomposition of plasma, and disintegration of nuclei. In animals which have been kept still longer under morphin, the cell alterations are not so intensive, but have a more chronic character, so that shrivelling and honeycomb degeneration of the elements are more frequently encountered, the latter perishing in great numbers under these conditions also. In animals, fatty degeneration of the cells and blood vessels plays no part. In the rabbit it is still clearly demonstrable; in the guinea pig it is already very slight; in mice it does not appear at all. All alterations of ganglion cells are accompanied by corresponding glia reactions. The vessels in animals longest under poison are somewhat thickened and generally copiously filled with blood, so that, when dissected, the brain appears highly hyperemic. Extensive hemorrhages in the meninges and the cortex are seen frequently even after a short period of poisoning. Separation of medullary fibres is entirely absent. The different localization of cell alterations in human beings and animals is very important. In the rabbit they show a decided preference for the cortex, the third and fifth layers in the forebrain being most seriously affected. Here, too, the cornu Ammonis is generally most seriously altered. The deeper parts of the brain, preëminently the striatum, are more severely affected in the rabbit than in man. In the guinea pig the alterations in the cortex and striatum are about equal; in fact, the cortex is quite often less diseased than the striatum, and there are even quite severe alterations in the deeper centers way down to the nuclei of the cranial nerves. In mice the cortex is only slightly altered. On the other hand, the ganglion cells in the striatum and the deeper centers of the brain, down to the spinal cord, are most highly diseased. In accord with this, the clinical symptoms of poisoning in animals are essentially different from those in man. *Striatal* symptoms are preëminent; muscular rigidity in body and neck (*opisthotonus*), pathologically intensified retention of a certain position, stiffness, trembling. Likewise, the typical manner of holding the tail observed in mice and important for the biological demonstration of morphin is no doubt to be referred to the general muscular rigidity and striatal causes. In animals longest under poison the striatal symptoms are less prominent, making place for certain changes in demeanor, above all, anxiety and timidity.

---

[75] The brain alterations in the human cases and in the animals have been presented by me in detail and critically discussed in the Zeitschr.f.d. ges. Neurol.u. Psychiatrie. Here they will, therefore, be only briefly reported and discussed.

Lungs.

"The lungs regularly appear congested in animals. Subpleural hemorrhages, inspissations, pneumonia of the inferior lobe, are frequently seen. Microscopically, too, the hyperemia of the lungs is very distinctly apparent. Frequently there is a discharge of dropsical fluid or erythrocytes into the alveoli. Hemorrhages of this sort were very extensive in some animals, especially in mice, so that even larger bronchi were filled with blood. Frequently alveolar epithelium, which had undergone fatty degeneration and desquamation, is mixed in with the dropsical fluid. Bronchopneumonia and severe bronchitis are seen rather often, especially in guinea pigs.

"In the human case of which histological examination was made, there was found unexpectedly a fat-embolism, which, originating from some unidentified trauma (?) caused swift death through pulmonary œdema, quite independently of the morphin poisoning, no doubt.

Heart.

"In the human case there is present a severe and diffuse fatty degeneration of the heart muscle which, in part, has reached an exceedingly high degree. In animals the heart is generally filled with fluid blood. Microscopically there is evident in acute poisoning only a certain indistinctness of the transverse striation. After a longer period of poisoning fatty degeneration of the heart muscle is found in rabbits, but not regularly. Thus, in animals longest under poison, which stood the morphin very well, there was only a suggestion of it; it was most severe—to the point of fatty disintegration of the muscle fibres—in one which had been under poison for 10 days; but this animal displayed serious organic alterations in other respects also. In the guinea pigs there was incipient fatty degeneration of the heart, but only rarely and never to such a high degree as in the rabbit. The heart muscle may here be thoroughly normal even after prolonged poisoning. Fresh myocardial hemorrhages were strikingly frequent in guinea pigs. In mice, even after prolonged poisoning, there were no heart alterations whatever.

Liver.

"In the chronic morphinists the liver showed a high degree of atrophy due to congestion along with severe fatty degeneration and contraction of the central trabeculæ of the hepatic cells, in addition to cirrhotic proliferation and infiltration of the periportal connective tissue.

"In the rabbits the liver was extremely plethoric, and the outline of its lobules generally indistinct. In animals subjected to acute poisoning or kept under poison up to 2 days, only hyperemia and slight increase of fat in the central hepatic cells are seen microscopically. Likewise, in animals under poison for a longer period this abnormal plethora of the liver is usually present and frequently leads to contraction and rather severe fatty degeneration of the central trabeculae of the hepatic cells, in connection with which there is also an increase of fat, though not so distinct, in the hepatic cells of the periphery. In addition, the animals often show increased fatty degeneration of the stellate cells on the lobular surface. In an animal under poison for 5 days there was even incipient central lobular necrosis. The hepatic cells and their nuclei were here included in the decay; the intralobular capillaries were highly dilated. In several animals there were small hemorrhages in the liver. In a rabbit under poison for 10 days these dominated the picture completely, having wrought utter confusion in the hepatic tissue; the hepatic cells, dissociated by them, had suffered fatty decay. A little iron was found a few times in the peripheral hepatic cells.

"In the guinea pigs the liver was usually not hyperemic; rather often, on the contrary, after a period of poisoning of some duration, it was pale, grayish-yellow, brittle. Only in animals under poison for some time could fairly severe congestion be determined microscopically; in one case this had led to the contraction of the trabeculae of the hepatic cells. The chief alteration in the guinea pig was fat deposit, and, in fact, this fatty degeneration of the liver generally increases in severity the longer the animals are kept under poison. It is then no longer possible, as in the normal animal, to distinguish in the lobular surface the hepatic cells that have undergone considerable fatty degeneration from those which have no fat at all or only small quantities of fine droplets; but all the hepatic cells contain more or less abundantly finely-granulated as well as larger drops of fat, so that there is presented the picture of a diffuse fatty degeneration of the liver without distinct degeneration of the cells. The stellate cells, too, have generally undergone considerable fatty degeneration. This, however, is not a regular finding. In the animal longest under poison the hepatic cells contained no fat at all beyond a few insignificant droplets. But as evidence of rather severe degeneration, they displayed a peculiar flaky disintegration of their plasma. Only in a guinea pig under poison for 10 days was there present considerable hemosiderin deposit in the lobular surface. Otherwise, the liver was always free of iron. In an animal kept longer under morphin, there had resulted small hemorrhages in the hepatic parenchyma.

"In mice the liver is usually hyperemic after acute poisoning. After prolonged poisoning this hyperemia is usually not so distinct. In isolated cases there were hemorrhages in the hepatic tissue. After poisoning of short duration, there is an increase of the fat content of the liver, already fairly abundant in the normal animal. Hepatic cells which have undergone complete fatty degeneration, encountered in the normal animal only singly, are here seen in groups. After prolonged poisoning, from about 7-9 days on, the fat content of the liver decreases rapidly, so that finally the liver is almost completely free of fat, and cells with drops of fat are met only here and there in the plasma. This loss of fat in the liver is very distinct in animals longest under poison. In addition, the hepatic cells then display flaky decomposition and vacuolar degeneration of their plasma. Their nuclei, however, remain well preserved. There is no deposit of hemosiderin.

Kidneys.

"The human case shows considerable fatty degeneration of the kidneys, which affects not only the collecting tubules but also all the canal systems, and especially, Henle's loop and the intercalary tubules.

"In the rabbit, the kidneys appear hyperemic macroscopically and microscopically. The epithelium of the tubuli contorti (convoluted tubules) is cloudy. In addition, after prolonged poisoning, there is generally found much more severe fatty degeneration of the intercalary tubules and Henle's loop than in the normal animal. These showed most severe degeneration, being filled with large drops of fat, in a rabbit 14 days under poison. In the tubuli contorti also there appears usually, but not regularly, degeneration to fine droplets of fat after a prolonged poisoning. There was no evidence of hemosiderin in the kidney.

"In the guinea pigs the increase of fat, especially in the intercalary tubules and Henle's loop, is still more striking. After prolonged poisoning, these may contain fat in large drops and may even suffer fatty decomposition. There is also an increase of finely granulated fat in the tubuli contorti and in the collecting tubules, which in the normal animal contain only isolated drops of fat. But this, too, is not a regular finding. For in the guinea pig longest under poison, it was strikingly slight.

"In mice the kidney displays only a varying degree of hyperemia, but never fatty degeneration. In one animal there was interstitial nephritis, which was probably independent of the poisoning.

Spleen.

"In the chronic morphinist this shows no essential alterations; in animals, too, it is usually only abnormally plethoric. In the rabbit hemorrhages are often found in the pulp. The cells of the pulp quite often contain increased fat after prolonged poisoning. There was never any evidence of increased hemosiderin.

Testicles.

"In rabbits and mice these show no change. In guinea pigs, after prolonged poisoning, the seminal cells generally show considerable fatty degeneration, but not the interstitial cells. In the chronic morphinists the seminal cells likewise contained finely granulated lipoid in great abundance, and the interstitial cells, too, here showed a high degree of fatty degeneration.

Urinary bladder, digestive tract.

"Their fulness varied in the rabbits. In an animal which had been subjected to acute poisoning and had had a discharge of urine before death, it was empty; likewise in some animals which had undergone prolonged poisoning. In the rest it contained 10-20 cc., in one even 60 cc., of urine. The digestive tract was always well filled, in some cases even to excess. In the guinea pigs and mice, neither bladder nor intestine generally showed unusual fulness.

"The *central nervous system* is the *most severely* affected in morphin poisoning. The alterations in this, because of their intensity and regular occurrence, are in the foreground of the pathologico-anatomic picture of poisoning. In agreement with this, the cerebral symptoms usually predominate completely among the clinical symptoms of poisoning. *Death in morphin poisoning is a brain death.* In the most acute form of poisoning, distinct brain alterations are already apparent which sufficiently explain its swift issue in death before other organic alterations have had a chance to develop, and this fact is confirmed by the experiments on animals. The findings in the central nervous system in the human cases of poisoning have far-reaching similarity. In the acute case they cannot be referred solely to the morphin poisoning, which proved fatal within 12 hours. There it is rather a matter of a chronic brain process, which had been going on for some time, overlaid by acute alterations (acute cellular disease, amœboidosis of the glia, irritation of the endothelium, hemorrhages). Only the latter may be attributed to the acute poisoning, and show striking correspondence to the alterations displayed by animals subjected to acute poisoning. What caused the chronic brain process in this case cannot be stated with certainty. The poisoned man may have been a chronic morphinist—it is well known that chronic morphinists use morphin for suicide very frequently—and the chronic brain process is to be attributed to the morphin abuse of longer standing.

"The brain alterations, as present in the human cases, occur in association with a great variety of troubles. They occur physiologically in old age, in the most varied forms of infection and intoxication accompanied by cachexia and anemia (tuberculosis, carcinoma, pernicious anemia), and in psychoses, especially in dementia præcox and melancholia. *They are, therefore, not at all characteristic of morphin poisoning.* They have recently been described by Maier in quite similar form for chronic cocainism. According to Bonhoeffer, they are also found very frequently in chronic alcoholism. Very little is as yet known as to their connection with psychic disturbances. The connection is probably very slight, however. For brain processes of this sort are often seen in individuals who have never in their lives had a psychic disturbance. On the other hand, they occur in pictures of the most severe psychotic states (Dem. præc.). In morphinism they are undoubtedly especially marked principally through their combination with vascularly conditioned atrophy of the cortex. They may suffice to explain the psychic disturbances, which so often appear here—often too, in highly pronounced form, and they are the *anatomic expression of the serious brain lesion which also results in the psychic disturbances, though they may not be regarded as the anatomic substratum for the latter.*

"Moreover, the brain alterations in acute poisoning are not specific and correspond closely to those observed in the most varied infections: (typhus, sepsis, scarlet fever, dysentery), and intoxications (CO, phosgene, phosphorus, veronal, etc.). In subacute poisoning they assume extremely serious forms and may then lead to extended liquefaction, decomposition, and destruction of the ganglion cells. Recently I saw a lesion of this sort through the entire central nervous system in a case of acute poisoning with arsenic which proved fatal within 6 days.

"The lipoid degeneration of the ganglion cells prominent in the human being is inconspicuous in animals. In the rabbit it is still to be found, in the guinea pig but little, in mice not at all. Probably the reason for this lies in the very different fat metabolism in the brain of these animals, which is very poor in lipoid even normally. In addition, a part is played, no doubt, by the very different poisoning tempo in the animals, their different way of reacting to the poison, and the especial severity of the brain alterations in them, the latter perhaps no longer permitting the appearance of such fatty degeneration.

"Of great importance is the different localization of the brain process in the human being and in animals, and above all, the penetration of the process in animals into the striatum and the deeper brain centers, while the cortex, especially in mice, remains notably exempt. Undoubtedly we must take into consideration here the fact that the intoxication in animals is much stronger and permits the appearance of alterations in brain regions which would otherwise be spared by the process. In addition, however, there is evidently a different sensitiveness of the individual brain centers in human beings and in animals. The further down we go in the animal scale, the more sensitive is the striatum to poison, while the cortex, in accord with its defective development, shows less and less change. Similar differences in the localization of the brain alterations in different animals are known also for other poisons, e.g., phosphorus (Kirschbaum, Lewy).

"The effect of morphin on the brain is in the main *direct,* as the poison directly injures the various constituents of the neural parenchyma, especially the ganglion cells. In chronic poisoning, a *secondary* lesion of the central nervous system also plays a part—through the general cachexia and anemia—to which the poisoning finally leads, and which combines with the morphin effect. Morphin has no special point of attack in certain brain centers, such as is observed for other poisons (nicotin, methyl alcohol—retina; botulism—medulla; stovaine—anterior cornu). It does by far the greatest damage to the cerebral cortex (in animals, the striatum), which is in general the favorite point of attack for the majority of the diffuse, toxic, and infectious brain processes. But morphin also exerts a secondary effect on the neural tissue through lesions which come in a roundabout way through disturbances in the circulation. Evidence of this is found first of all in the hyperemia of the brain, which is frequently very severe; also in the frequent occurrence of diapedetic hemorrhages in acute poisoning, which may frequently lead, as with other poisons (veronal, phosgene, CO), to real brain purpura (F. Strassmann); in the especially severe affection of the hippocampal regions; and, most important, in the chronic degeneration of the walls of the brain vessels, as seen in man and animals after prolonged intoxication.

"The *alterations of the remaining organs* become inconspicuous in comparison with those of the central nervous system. As is generally the case in alkaloid poisoning, it is not a matter of specific and regularly occurring morbid processes.

"In acute poisoning there appears only severe hyperemia of the internal organs, which is no doubt to be referred chiefly to the paralysis of respiration and to asphyxia. However, the paralyzing effect of morphin on the nerves of the vessels probably also plays a part. Besides the brain, the lungs also display congestive hemorrhages and œdemas, for which an increased permeability of the vessel-walls, consequent upon the action of the morphin, is perhaps to be held responsible. Hemorrhages of this sort have been found with comparative frequency in acute poisoning (Strassmann, Sysak). In addition to the hyperemia and the hemorrhages, other alterations appear only after several days' poisoning, as shown by the animal experiments. In antithesis to this, Sysak—to date alone—found severe central necrosis of the liver and fatty degeneration of the parenchymatous organs in a case of acute poisoning, which proved fatal within 1½ days. He emphasizes the similarity of these findings to those for poisoning with phosphorus, chloroform, and mushrooms, and he thinks that in morphin poisoning also there result disturbances of metabolism and lipemia, in connection with which it might be asked whether the fatty degeneration is due to diminished nutritive resorption, disturbances of the function of the liver in the sense of defective oxidation, or the activating of lipolytic ferments together with the mobilization of the fat depots. Intensive fatty degeneration of this sort in connection with the internal organs has not yet been observed in acute morphin poisoning, not even in animal experiments. The fatty degeneration of the organs which finally sets in here after prolonged poisoning has a different significance. Moreover, central necrosis of the liver, as in Sysak's case, within 1½ days after the poisoning would be very remarkable. To be sure, among other alkaloids, *cocain* manifestly can produce very quickly such necrosis of the liver and fatty degeneration of the parenchyma. Thus, Erzer observed for cocain poisoning a finely-granulated fatty degeneration in the human liver within 30 minutes, and severe necrosis of the liver in poisoned animals, especially in mice, within a half day. With cocain, however, we have manifestly an entirely selective action of the poison on the liver similar to that produced by poisoning with phenylhydrazine, amylene hydrate, paraffin oil, and such as cannot be assumed for morphin according to our experience to date with human beings and our experiments on animals. Sysak's case was complicated by pulmonary tuberculosis, lobular pneumonia, exudative pleuritis, and solitary tubercles in the liver. It seems to me that, as Sysak also suggests, the organic alterations must be referred chiefly to the severe tuberculosis, and that at most the acute morphin poisoning served only to promote this as well as the necrosis of the liver. In acute and chronic poisoning there appear then, as shown by the human cases and the animal experiments, organic alterations which in part are quite considerable. In the foreground is the lesion of the parenchymatous organs, which finds expression principally in an increasing fatty degeneration. This is most pronounced in the liver, generally finely granulated and accompanied irregularly by a degeneration of the stellate cells also. Next in order is the fatty degeneration of the kidneys and the heart. The heart lesion is particularly important. It explains the extremely bad condition of the heart frequently encountered among morphinists. But even in chronic poisoning there never occurs the fatty infiltration of the large parenchyma such as is found in poisoning with phosphorus or alcohol. The organic fatty degeneration in connection with the morphin poisoning induces, as seen repeatedly in human beings, a pronounced *cachexia*. In animals also, even after a comparatively short period of poisoning, there occur extraordinary losses in weight and extreme emaciation, because the resorption of nutriment is more or less checked by the intestinal atony, the fat reserves are reabsorbed, and the processes of oxidation, as shown by Schuebel's experiments in metabolism, are greatly reduced. These defective oxidation processes are probably the chief cause, along with the disturbed nutritive resorption and the direct injury to cells caused by the morphin, of the fatty degeneration of the organs. Disturbances of the circulation, especially in the form of passive hyperemia in the liver, must undoubtedly be considered along with these. Thus, through the combined action of these lesions generally, there develops after prolonged poisoning the fatty degeneration of the liver, kidneys, and heart musculature. The loss of fat and the degenerative cell alterations in the liver, which finally occur in guinea pigs and mice, are evidently to be explained by the fact that after the resorption of their fat reserves the animals are in a state of hunger and the hepatic cells suffer especially intensive injury from the severe poisoning. We then see a disappearance of fat from the cells resembling that which occurs in grave disorders due to under-nutrition and metabolism (Lubarsch). The fatty degeneration of the organs in connection with chronic morphin poisoning would correspond, therefore, in general to those frequently occurring in connection with chronic infections and intoxications, anemia and cachexia, also e.g. in connection with prolonged chloral action or CO-poisoning (Jacksch, Roos), as the manifestation of lowered oxidation processes and disturbed cellular metabolism. The lipuria observed by Schuebel in morphinized dogs is sufficiently explained by the fatty degeneration of the kidneys.

"The passive hyperemia of the liver may lead to a congestive atrophy, as is evident from the animal experiments and one of the cases of chronic poisoning. In one rabbit there had even developed central lobular necrosis. Morphin, therefore, may bring about—but only after prolonged action—a necrosis of the liver, consequent upon severe circulatory disturbances in combination with direct cell injury. Still, this rarely happens. These hepatic lesions play a more important part and appear more regularly in connection with poisoning through other soporifics. In experimental poisoning with dial and veronal, Samejuma regularly observed, in addition to the fatty degeneration of the heart, hemosiderosis and atrophy of the spleen, nephrosis, and pronounced pulmonary lesions, similar to those observed in connection with morphin, a severe hepatic lesion, not in the form of fatty degeneration, but of necrosis and vacuolization of the hepatic cells, similar to those observed in connection with cocain (Erzer). After prolonged morphin poisoning the vascular lesions may become so intensive, that extensive hemorrhages may occur also in the myocardium and the liver in addition to those in the brain and the lungs. Nevertheless, according to the results of my animal experiments, augmented decomposition of the blood plays no essential part. For hemosiderosis of the liver was present in a few animals only. Nevertheless, it is possible that hemosiderin deposits in the internal organs might have been more conspicuous, if the poisoning had been continued for a longer period.

"The pulmonary lesions in animals are quite important. We regularly find here more or less severe hyperemia and, consequent upon capillary lesion, congestive hemorrhages and œdemas, which lead to bronchitis and bronchopneumonia, to which the animals are, of course, especially liable by reason of the defective ventilation of their lungs, the lowered oxidation processes, emaciation, and lack of exercise.

"The hemosiderosis, general amyloidosis, and testicular atrophy, observed by Sysak in a case of chronic morphin poisoning, are probably likewise not attributable to the morphinism alone. It is manifestly a matter of the effects of chronic sepsis resulting from recurring skin abscesses, enterocolitis, cholelithiasis, pulmonary lesions, and anemia, which were already present in the patient and now combined with the action of the morphin.

"The retention of urine in connection with morphin poisoning is frequently regarded as especially significant with reference to diagnosis. Morphin causes atony of the urinary bladder as well as of the intestine, so that the former is generally pretty well filled in animals, there being no essential disturbance of the urinary secretion. Nevertheless, this is not a regular finding. For frequently it was also found normally filled or else, especially when the animals had had an involuntary discharge of urine before death, empty, so that the diagnostic significance of the abnormal bladder fullness must be designated as very slight.

Addendum.

"At the close of the foregoing investigations another case of *acute morphin poisoning* came under my observation through the kindness of Dr. Kipper.

"The case concerns a 5-year-old boy, who was poisoned by his father with morphin, or in all likelihood, pantopon. The father also took the poison and died shortly after. The contents of his stomach revealed considerable morphin. The child was brought to the Charité in a condition of deep coma, with pinpoint pupils almost without reaction, and poor respiration and heart action. In the next two days respiration and heart action improved a little. He also became semi-conscious. Now, however, tonoclonic convulsions, particularly in the region of the facial and the hypoglossal nerves, made their appearance in quick response to noises and touch; also, fibrillar muscle twitchings, states of excitement resembling delirium along with rising and sitting upright, impulsive crawling about, loud screaming, and highly pronounced variations in cerebral temperature. At the end of the 2nd day, abatement of these symptoms; on the other hand, paralysis of respiration and heart, incipient bronchopneumonia, and finally death, about 2½ *days after the poisoning.*

"The *autopsy* (Prof. Wätjen, Pathol. Inst., Berlin) disclosed extreme venous hyperemia and swelling of the brain with flattening of the gyri, hyperemia of the pectoral and abdominal organs, bronchopneumonia and pulmonary emphysema, status lymphaticus, swelling of the splenic pulp, anemic spots in the liver, and heavily-filled urinary bladder.

"Histologically it is a case of *extremely severe degeneration* in the central nervous system, which becomes very intense in the cortex and the cornu Ammonis. The ganglion cells in the 3rd cortical layer show the most serious alterations—principally acute disease or liquefaction. In the frontal lobe the process has in part advanced so far that the cells are here almost all necrotic (cellular "ischemia") and this has caused laminar degeneration in the 3rd layer. Cell destruction of similar intensity has occurred in the pyramidal band of the cornu Ammonis, which on that account also appears considerably atrophied. The alterations in the ganglion cells in the remaining cerebral regions are not so intensive. Still, even here there are seen, in places, quite serious processes of liquefaction and degeneration, which have produced intensive glia reactions in some basal ganglia regions. A slight fatty degeneration of the ganglion cells is in fact present in the 3rd cortical layer and the cornu Ammonis, but it is quite insignificant. The venous cerebral vessels, in particular, are heavily filled with blood. In the cortex and cornu Ammonis, the cells of their walls do not contain, in view of the child's age, pathologically augmented lipoid matter. In the pia, and here and there in the brain itself, there are diapedetic hemorrhages, which are occasionally extensive.

"Of the remaining organic alterations the most striking is an *extremely intensive, diffuse fatty degeneration of the heart,* which has caused here and there the fatty decay of muscle fibers.

"The liver also shows principally central fatty degeneration, though symptoms of decay in the hepatic cells are not perceptible. The stellate cells, too, contain considerable lipoid. In the periportal connective tissue are infiltrations of round cells.

"In the highly plethoric kidney there is likewise a severe, partly coarsely granulated fatty degeneration of Henle's loop and the intercalary tubules. In the tubuli contorti also there are here and there fine fat droplets. Moreover, they contain everywhere hyaline and granular casts.

"The splenic pulp contains a little hemosiderin. The germinal centers of the lymph follicles are strongly developed. The lungs appear very plethoric; there is considerable fatty degeneration and desquamation of the alveolar epithelium. Bronchitis and localized pneumonia have developed.

"Of great interest in connection with this case of *morphin poisoning, which proved fatal within* 2½ *days,* is the exceedingly severe, purely *degenerative brain process,* in comparison with which the alterations in the other organs are quite insignificant. Here, too, it is undoubtedly a matter of *brain death,* just as the clinical picture of the poisoning was purely cerebral. Incidentally, the convulsions, very similar to those occurring in connection with strychnin poisoning, are quite remarkable and indicate the action of pantopon. The brain alterations correspond to those which I was able to produce in animals by poisoning them for several days with large doses of morphin, and also to those observed in connection with other toxic processes (sepsis, gas-gangrene, whooping-cough, etc.). In the remaining organs it is essentially a matter of passive hyperemia and fatty degeneration of the parenchyma, which is quite considerable in the heart muscle, but not as yet highly pronounced elsewhere. The case thus confirms the foregoing conclusions to the effect that in morphin poisoning we are not dealing with a fermentative mobilization of the fat reserves, lipemia, and fatty degeneration of the large parenchyma, such as are found in poisoning with chloroform, phosphorus, and agaricus phalloides, but that we are dealing essentially with a general lowering of oxidation processes and with toxic cell lesion, which finally and, on the whole rather rapidly, lead to organic fatty degeneration in addition to the circulatory disturbances, as shown by this case. Particularly noteworthy also are the serious pulmonary lesions, which correspond to my observations in the other human cases and the animal experiments; and likewise, the cast formations in the kidney. These suggest a more serious nephritic lesion than has apparently been observed to date in connection with morphin poisoning."

Hans Gerhard Creutzfeldt—1926.[76]

After commenting on the infrequency with which pure cases of chronic morphin poisoning come to autopsy, and citing the neuropathologic findings of Spielmeyer, Weimann, and Husemann, the author reports in detail the histologic changes observed in a case of morphinism dying from acute morphin and veronal poisoning, in which he considers the effect of the veronal taken to have been slight if any.

The case was that of a woman of twenty-six, a morphinist for about two years who took with suicidal intent unknown quantities of morphin and veronal about two hours before admission to the hospital, when she presented the symptoms of morphin poisoning. The condition of the patient while in the hospital and the author's reasons for concluding that death was due to morphin rather than veronal poisoning, are given in the following quotation:

---

[76] Creutzfeldt, Hans Gerhard.—Histologischer Befund bei Morphinismus mit Morphium-und Veronalvergiftung. Ztschr. f.d. g. Neurologie u. Psychiatrie. Vol. 101. 1926. pp. 97-108.

". . . At the time of her admission to the hospital she was in deep stupor and without any sign of mental reaction. The pupils were constricted and fixed, the complexion pink; Achilles and patellar reflexes normal; no pyramidal symptoms; pulse and respiration normal; in 553 cc. of stomach contents there were 0.05 g. of morphin and less than 0.5 g. of veronal. The next day cyanosis appeared, but with good pulse. The first symptoms of stasis pneumonia were noticed. In 1,160 cc. of catheterized urine (retention of urine) 0.0974 g. of morphin and 1.015 g. of veronal were found. Treatment without any effect. The condition grew worse, the paralysis of respiration increased; temperature rose to 39.9, pulse tense and frequent. On January 22, at 1:45 p.m., about 60 hours after the poisons had been taken, death occurred. We see the case of a morphin-addicted woman poisoned with a considerable quantity of morphin and a small—apparently not fatal—quantity of veronal, taken with the intention of suicide. This may be assumed not only in consequence of the quantitative proof of the poisons in the gastric juice and in the urine, for in both secretions fatal quantities of morphin, but not fatal quantities of veronal, were found; but also because, as will be remembered, morphin, as has often been stated, appears only in very minute quantities in the urine, and much less in the gastric juice of morphin-addicted persons than in that of normal persons, while it is well-known that veronal is extensively eliminated by the kidneys. Also the clinical report is characteristic of poisoning by morphin: skin lightly hyperaemic, absence of any reaction, myosis, good heart activity of long duration with increasing paralysis of respiration. Veronal, on the other hand, usually affects the action of the heart, produces cyanosis, nystagmus and spasmodic tendency. Therefore it seems justified to disregard the veronal poisoning in the present case and to make a diagnosis of 'acute morphin poisoning in chronic morphin addiction'."

The autopsy findings are given in full in the following:

"Marked passive congestion and oedema of the brain; passive congestion of liver, spleen, and kidneys; old calcified mesenteric lymphatic glands; marked passive congestion and oedema of the lungs, congestive catarrhal haemorrhagic inflammation of the bronchi; marked parenchymatous tumefaction of the spleen; extensive centres of regeneration in the bone marrow; vermiform appendix absent after operation; peritoneal growths around the cecum and lower ileum; perihepatic growths on the diaphragm; in the gall bladder a stone about the size of a cherry stone.

"The cerebral meninges and the brain itself were in general very congested and showed an increase in their fluid contents; this acted as an oedematous infiltration of the meninges, and in the brain, as its soft consistency indicated by the obliteration of the convolutions and its increased weight. The weight was 1,580 g.

"The microscopic examination was made according to the methods of Nissl, Alzheimer, and Spielmeyer, with alcohol-formalin specimens.

"In the Nissl preparation distinct changes of the nerve cells were seen in the cortex of the frontal and temporal lobes; less in the central region and in the occipital lobes, mostly however in the hippocampus major. Especially changed were the medium-sized pyramidals of the third and the deep fifth, not so completely those of the sixth Brodmann stratum. The prevailing characteristics of this disease of the cells were chiefly inflation of the cell body and granular degeneration of that portion stained by Nissl's method (Nissl bodies). The protoplasm around the nucleus was lighter than the marginal protoplasm, the nucleus pale and swollen; the nucleolus peripherally situated, vacuolated and metachromatic. The loss of color of the cells seemed to spread peripherally. In some elements a fine honeycomb structure was seen; also small annular structures and a fibro-granular degeneration. From this, various intermediate forms progressed to pale, shrunken, shadowy structures, still showing traces of granulation. The apophyses—especially of the extremities—were frequently swollen in the enlarged cells, the unstained tracts more or less stained. Thus they seemed to degenerate quickly. Sometimes they looked as if torn from the cell body. The pericellular neuroglial cells had nuclei which stained well, and some partly enlarged protoplasmic bodies of fine reticular structure, containing metachromatic granules. Figures of segmentation were not found. The process in the nervous elements seemed to have exercised only slight irritation upon the forms of glia cells undergoing decomposition. Also the degeneration of nerve cells, causing formation of small empty spaces, could produce marked substitution—proliferation of the glia. There were centres of degeneration already formed or in process of formation (see Ill. 1).[77] It seemed, indeed, that in the hilum of the hippocampus major, as appeared in the Cajal preparation, an increase of the protoplasm-infiltrated astrocytes occurred, for numerous forms of quadriga and very large elements with many apophyses were found there. Further, a thickening and condensation of the marginal fibrous tissue in the cortex and in the hippocampus major was noted. In the striatum (C. and O. Vogt), especially in the ventromedial parts of the caudate nucleus, the small nerve cells were slightly swollen, and almost all had faded. The cell body was of reticular, granular structure, the apophyses almost invisible, the unstained tracts still unstained. Numerous elements were apparent only as shadows. The pericellular cells contained fine and large granules of bluish green and golden yellow color, although in the ganglion cells belonging to them no vacuolization, or fatty degeneration, or deposit of pigment could be found. There were Hortega cells, partly filled with pigment. With the iron dye (Turnbull's method) these grains or layers of pigment were slightly blue in color, their margin was more deeply colored, sometimes the nucleus was of dark blue. Also in the cells of the vessel walls of this region siderophile pigments were accumulated. They stained only partly with scarlet. The oligodendroglia cells contained one or several siderophile globules. Numerous concretions of pseudo-calcium were found in the region of the whole striatum. The cells of the nucleus dentatus in the cerebellum were much enlarged; they were pale and contained rather abundant pigment of greenish blue color. In some glia cells of the Hortega type a great accumulation of coarser grains of pigment was seen. In the neighboring vessels the adventitia cells had likewise stored considerable pigment, but this did not give the reaction to iron. The cells of the pallidum, the substantia nigra, the locus coeruleus, the nucleus of the pons Varolii, and the cortex cerebelli, however, had changed but little. But concretions of pseudo-calcium, large and small grains of pigment, seemed to have increased in the glia and in the vessels. Signs of marked degeneration were seen in the ganglia about the third ventricle (nucleus paraventricularis, nuclei tuberis, ganglion supraopticum) in which enlargement of cells, and further shadowy forms, were found. In the more ventral parts on both sides of the nuclei dorsales vagi no visible changes could be noted, but the cell accumulations nearer to the floor of the fourth ventricle contained remaining faded elements, shadowy, or broken into fragments. Contrary to the above described marked transformations, the motor and sensory nuclei of cerebral nerves were almost intact. Their cells had good chromatin marks and were of regular form and size. The nerve cells of the spinal cord were also in good condition; unfortunately only portions of the cervical spinal cord could be examined. An exception must be made for the oculomotor nucleus, which showed numerous greatly enlarged elements.

---

[77] Illustration omitted.

"In the vessels, evidence of a thickening of their walls was generally lacking. Only in the inter- and midbrain two veins thickly surrounded by lymphocytes were found. Moreover, the endothelium nuclei were slightly vesicular, the protoplasm of the endothelial cells was finely reticular in structure. But in many subependymal cortical vessels, and in those vessels passing the plexus (precapillaries and veins) some adventitia cells showed large vacuoles.

"The most marked changes were seen in Herxheimer preparations. Here a marked fatty degeneration of all cortical elements was noted, both of the nerve, glia, and mesodermal cells. The ganglion cells were filled with little fat globules, spread over the whole body of the cell, or limited to its lateral parts, its base and its end apophysis. In the hippocampus major (Ill. 2)[78] where the fatty degeneration was extreme, there were also large fat globules in the nerve cells; and the cell apophyses, especially the end apophyses, were noted as wide bands filled with fat. The pericellular cells likewise contained fat globules. They were thickly clustered in the whole cell body, and diminished only very slightly towards the margin of the cell. In the glia elements with large and pale nuclei, however, the distribution of the fat was seen in fine rays, or in the form of garlands, free, and beginning only at a certain distance from the nucleus. In the epithelial glia cells, the oligodendroglia—so-called by Hortega—generally a single fat globule of medium size was found.

"In the cells of the walls of the vessels we must distinguish two forms of fat accumulation. First, they were filled with a fine, powder-like fat in the protoplasm of the endothelium, so that the walls of the vessels appeared in the preparation as fine red lines; then an accumulation of fine and coarse fat droplets in the adventitia cells, partly transformed into granular cells. While both were found in the gray matter, the greater fatty accumulation was found in the medulla, where, moreover, fatty layers of pigment appeared near the bright red fat globules. The fatty degeneration was most marked in the hippocampus major, in all its portions, also in the small cells. Often there were only globules of fat, without nuclei, where nerve elements would be expected. In the frontal and temporal lobes likewise a diffuse, although in general not so marked, fatty degeneration could be noted, while in the central region only the small and medium-sized elements showed an accumulation of fat, and the Betz cells contained only a few small droplets. In the most infiltrated elements it sometimes happened that the nucleus was displaced and granular cells were formed.

---

[78] Illustration omitted.

"Special attention was paid to the plexus choroideus. In the Nissl preparation fine ependymal cells showed a marked enlargement, chromophilia of the outer region of the cell body, with the margin of the cell separating into fibres, infiltration of basophile, metachromatic grains and fragments, vacuolization and shrinking, and hypergliomatosis of the nucleus. In the preparation numerous, mostly large, fat drops were seen. Often all ependymal cells contained a villus of fat (Ill. 3).[79]

"Examining the foregoing, we see different kinds of histopathological changes, three of which are to be emphasized. The whole process is to be looked at as non-inflammatory. This opinion cannot be influenced by the few infiltrated vessels in the midbrain and interbrain. The simplest explanation is to attribute them to the terminal pneumonia. Weimann likewise has noted a slight infiltration of lymphocytes in cases of morphin poisoning. The question, whether they may have a closer relation to the intoxication, cannot be definitely denied for the present; therefore I content myself with mentioning it, refraining from more or less poorly grounded assumptions.

"Among the changes of the nervous parenchyma the most astonishing and remarkable one is the marked fatty degeneration, found especially in the elements of the third cortical layer and in all cells of the hippocampus major. It is not limited to the nervous elements, but exists also in the glia and in the endothelium of the vessels. It is distributed in fine droplets in the protoplasm. Larger drops are found in Hortega cells and in some nerve cells. In the astrocytes less frequently slightly larger globules of fat are seen. There are, however, large globules and strata of fat in the adventitia cells of the vessels.

"The question whether we have here a case of acute fatty degeneration or a chronic fat accumulation is not easy to answer. The slight reaction on the part of the Hortega cells perhaps may be assumed to indicate a very recent process. But there seems to be no valid proof that this reaction had not enough time for development in the two days following the acute poisoning. We see on the one hand that the Hortega cells can proliferate exceedingly early, if there are severe morbid transformations in the nerve cells; and on the other, they are not so much affected by the fatty degeneration of the nerve cells as they are by processes, in which a proteoid decay of the protoplasm prevails. But that in this case there was already a removal of fat, is undoubted. Not only the accumulation of large fat globules in the adventitia cells of the vessels, but especially the fatty, ferruginous pigments in Hortega cells and elements of the walls of the vessels found in the cortex, in the striatum, and in the dentatum, point to the fact that decomposition products have been deposited for a long time. The observations of other authors should not be considered as direct contradictions to this assumption. Unfortunately they are not typical enough, being taken from mixed cases (Husemann). I had, however, an opportunity to discuss more carefully the findings of the Spielmeyer case of acute morphin poisoning with Dr. Weimann. Compared with my case, there was undoubtedly a slighter degree of fatty degeneration. On the other hand, Dr. Weimann told me of a case of more severe morphin addiction, that did not die from an acute poisoning with morphin or other poisons; in this case the fatty degeneration was still more marked than in the one here described, Dr. Weimann said. In view of this report—Dr. Weimann has seen my preparations—I think that the case under consideration can be classified between the two cases cited, and I should like to say—with all reservations necessary in all single observations—that in this case the fatty degeneration is the result of the chronic poisoning. That these are chronic changes is apparent also from the older losses of nervous tissue in places. Besides this, the ferruginous pigments, appearing abundantly especially in the striatum, are a distinct sign of an injury—although not too severe—of this nuclear region, which has existed for a long time.

---

[79] Illustration omitted.

"As acute changes I would first regard the atrophy of the nerve cells in the cortex and in the dorsal vagus nucleus. They seem to be a consequence of the fatal morphin poisoning. This agrees with the results of Nissl, who, in his animal experiments, saw no fatty degeneration after maximal acute poisoning, but only proteoid degeneration of the nerve cells.

"In the treatment of morphin addiction the findings in the case of K. seem to be of significance showing remarkable morphologic injuries of the nervous system. At first we see that neither the nuclear regions nor the lower centres of coordination, but only the younger portions of the brain, and in them especially the gray regions, are most affected, i.e., the cortex, the striatum, and the dentatum. Within the cortex the third layer seems to be most affected. Its elements show a fatty degeneration, and we see the degeneration of nerve cells, which can lead and has led to strictly localized loss of functioning tissue. In the striatum likewise we see the proof of a remarkable disturbance of metabolism. It would be rather hazardous to evaluate these findings locally. But this much can be said, with due caution, that certain symptoms of morphin abuse indicate the existence of severe affective disturbances; such as the loss of will, the weakened resistance, the depravation. Furthermore, we see even in the case of the withdrawn morphin addict a weakness of judgment in the face of his desire and its consequences. Lastly, we know from Weimann's reports that severe dementia with paralytic-like symptoms may be observed in the case of morphin addicts. But as I said before, we will not go too far. As to my opinion, it is sufficient to state that *chronic morphin abuse causes injuries to the nervous system, which can be proved, and in part cannot be cured.* These injuries affect just the striatum in its interior parts and the third cortical layer of the frontal and temporal regions of the brain, while the lower parts of the brain seem to be less attacked and become affected only in the case of severe acute poisoning.

"That the hippocampus major shows marked changes may be considered, to a certain extent, as a local symptom, because its place is on the margin of the large liquor filter, the plexus choroideus, and on the bottom of the lateral ventricle, in a 'dead corner', as I should say, where the possibility of concentrated action of harmful materials contained in the fluid of tissues and ventricles is especially great.

"The fattening of the plexus endothelium seems to be of importance, considering the observations of Mesbrezal, F. K. Walter, and Hauptmann on the permeability of the limiting membranes between blood vessels and surrounding spaces. Unfortunately I have not, for obvious reasons, had experience in permeability in morphin addicts.

"Once more let it be emphasized that the above case seems to be especially clear, because both the clinical picture and the anatomical findings do not point to any noticeable effect of the veronal taken by the patient, as indicated by the absence of annular bleeding—I refer to Weimann's report dealing in detail with annular bleedings in cases of veronal poisoning.

"Summarizing our findings in the case described above, we can make the following statements:

"1. In cases of morphin abuse the central nervous system is injured, as can be morphologically shown.

"2. The cortex is affected with a fatty degeneration, leading to the loss of nervous tissue.

"3. In the striatum ferruginous decomposition pigment appears in increased quantity.

"4. The plexus choroideus shows a fatty degeneration of its ependymal coating.

"5. The part of the brain most affected by chronic poisoning is the telencephalon.

"6. Acute morphin poisoning chiefly causes pure degenerative changes in the small and medium elements of the cortex, in the nerve cells of the periventricular regions, especially of the vegetative vagus nucleus."

M. Cloetta and E. Brauchli—1926.[80]

These authors studied the physicochemical changes in the blood in relation to the calcium and potassium concentrations caused by the administration of narcotics. Their observations in relation to these changes in chronic morphin poisoning in dogs are the following:

"Dog No. 12, which had reacted normally with a diminution in calcium of about eight per cent and a rise in potassium of about twenty-one per cent to a single injection of morphin, received small quantities of morphin subcutaneously every day from the 27th of December, 1924, on, beginning with five milligrams per kilogram. On the 16th day of January, 1925, it had received a total of 1.725 grams of morphin hydrochlorate. On the 17th, twenty-four hours after the last injection of morphin, it was given subcutaneously three centigrams per kilogram (after a preliminary estimation of calcium and potassium) and reacted with a mild restful sleep (experiment 12a). After this the dog was treated up to the 31st of March with small doses of morphin and on that day, again twenty-four injected, following which the blood was tested in the same way as before (experi- hours after the last injection of morphin, three centigrams per kilogram were ment 12b). During the next three days the dog received no more morphin, in order that its calcium and potassium content might be tested during this period of abstinence also (experiment 12c). The values obtained are collected in Table II.

---

[80] Cloetta, M., and Brauchli, E.—Der Einfluss des Morphins auf den Ionengehalt des Blutplasmas. Arch. f. exp. Path. u. Pharm. 1926. Vol. 3. pp. 254-262.

TABLE II

Experiment number	Dose per kilogram	Percentage changes of calcium and potassium		Remarks
		Ca	K	
12.	Morphin 0.03 gm.	− 8	+ 21	Normal
12a.	" 0.03 "	− 5	− 31	First morphin period
12b.	" 0.03 "	− 4	− 9	Second morphin period
12c.	. . . .	0	0	Abstinence

"In the same way a tolerance test was carried out with the dog that in Table I, Nos. 17 and 17a, is shown to have reacted normally to somnifen and in a reverse manner to morphin. First the animal was treated for five weeks with small daily doses of morphin up to one centigram per kilogram. The plasma was examined twenty-four hours after the last injection and then the same dose as before was injected, that is two centigrams per kilogram. The animal responded with a quiet restful sleep, whereupon the second blood test was made (experiment 17b). Then the morphin administration was continued three weeks longer, reaching twelve milligrams per kilogram, and at that time another test was made in the same way as before (experiment 17c). Now a period of seven weeks passed by, during which sixteen milligrams per kilogram were injected, and then the test with two centigrams per kilogram was carried out. This no longer caused a condition of distinct somnolence and the animal remained awake, but the sensitiveness to pain was perceptibly diminished (experiment 17d). Then administration of morphin was stopped entirely and three days later, during the abstinence period, a blood test was made once more (experiment 17e). The results are collected in Table III.

TABLE III

Experiment number	Dose per kilogram	Percentage changes of calcium and potassium		Remarks
		Ca	K	
17a.	Morphin 0.02 gm.	+ 9	− 33	Normal
17b.	" 0.02 "	− 7	− 11	First morphin period
17c.	" 0.02 "	− 5	+ 11	Second morphin period
17d.	" 0.02 "	− 5	+ 16	Third morphin period
17e.	. . . .	+ 5	− 18	Abstinence

"The tests indicated that in dog No. 12 chronic use of morphin did not affect the customary reaction of calcium to a fresh injection, a reduction in calcium always resulting as in a fresh animal. On the contrary, the derangement of potassium relation underwent an alteration on morphinization. The fresh animal had reacted with an increase of about twenty-one per cent to the first morphin injection, while habituation caused the first time a decrease of thirty-one per cent, the second time of nine per cent to an injection of three centigrams per kilogram. The second dog originally reacted to injection of morphin by a calcium increase and a potassium diminution. During morphinization each renewed injection of morphin caused a reduction of calcium, while the reduction of potassium was small at first and then became reversed. During periods of abstinence, too, the animals display different behavior. Dog No. 12 shows in both tests scarcely any change since the time of the last injection, and dog No. 17 an increase of calcium and an increase of potassium.

"On considering the alterations taking place in the two animals during habituation and abstinence as to absolute amounts in comparison with the normal, the following figures represent the calcium and potassium in a cubic centimetre of blood expressed in milligrams per cubic centimetre of plasma.

TABLE IV

Dog number	Normal		Conclusion of habituation		Abstinence	
	Ca	K	Ca	K	Ca	K
12.........	0.093	0.812	0.099	0.73	0.105	0.800
17.........	0.081	1.120	0.086	0.73	0.095	0.526

"Both animals display a tendency to a higher calcium content and a lower potassium content because of habitual use of morphin, so that dog No. 17 only reached half the original amount of potassium during the period of abstinence. But here again the alterations are quite dissimilar in the two animals, so that the irregularity observed on a single injection in different animals is repeated in morphin habituation.

"SUMMARY

"Administration of hypnotics of the aliphatic series always produces in dogs, in addition to somnolence, a diminution of calcium and an increase of potassium in the blood plasma, while the amount of sodium remains unchanged: there occurs besides a wholly unimportant reduction in surface tension.

"This regularity of occurrence ceases when morphin is injected, since in about half the animals an increase of calcium and a diminution of potassium took place, while in the other half the changes resembled the action of the hypnotic. Only in two cases were both the calcium and the potassium diminished. The sodium underwent no alteration in amount. The surface tension was depressed to a very small extent only, as with hypnotics.

"In chronic users of morphin as well there was no regularity in the derangement of calcium and potassium.

"These results demonstrate that in regard to the effects of hypnotics we are dealing with a very uniform influence of the organic ions, due to the invariable effect of these substances in partially paralyzing the brain, while morphin produces a very complex effect, variable in different individuals, which combines paralysis and excitation and central as well as peripheral action, and the alterations in the ions are correspondingly totally irregular and individually variable. In consequence, the chief differences in the pharmacological action of the two groups are very clearly defined. We perceive, therefore, in the regular ionic changes produced by hypnotics an organic reaction which has a genetic connection with the causation of sleep."

Kyusaburo Sato—1927.[81]

The author abstracts the results of studies on the metabolism of animals during chronic morphin intoxication as follows:

"In chronic human morphinism the body metabolism is increased only at the period of morphin hunger. In the opinion of a number of authors this is probably due to hyperfunction of the thyroid.

"As an addendum to studies of chronic morphinism in human beings, the author made experiments to determine the catalase content of the blood of chronic morphinists and of experimentally intoxicated animals.

"The results are as follows:

"(1) The catalase content of the blood of healthy individuals amounts on an average to 8.8 in males, 7.6 in females. The hemoglobin catalase index is 88 in males and 86 in females, according to Nakanishi.

"(2) The catalase content of the blood in chronic morphinism shows no striking difference between the action time and the hunger time of morphin. However, the values are on the whole somewhat lower than in healthy individuals.

"(3) In experimental chronic intoxication of rabbits, the catalase content as well as the hemoglobin index of the blood is always lowered.

"(4) But in acute intoxication this value is, on the contrary, somewhat increased."

Yutaka Teruuchi and Sotaro Kai—1927.[82]

These authors sought to determine the fate of morphin in the body in both acute and chronic poisoning. They decided, after reviewing the work of others, that the fate of morphin injected into an animal suffering from morphinism only can be explained by determining the amounts of morphin stored in the tissues and the total amounts excreted from the body taken in connection with the total amount of morphin injected during the entire period of immunization. They state:

"By investigating all the above-mentioned factors, we have learned that in morphinism the rabbit has, unlike the normal animal, a remarkably strong power to destroy morphin and also the fact that the rabbit in morphinism has a marked power to retain and absorb by far a larger amount of morphin in its muscle tissues."

---

[81] Sato, Kyusaburo.—Ueber den Katalasengehalt des Blutes bei chronischer Morphinvergiftung. J. Orient Med. April, 1927. Vol. 6. p. 50.

[82] Teruuchi, Yutaka, and Sotaro Kai.—Fate of morphin in animal body. J. Pharmacol. and Exper. Ther. 1927. Vol. 31. pp. 177-199.

They administered to a rabbit, during a period of 32 days in increasing doses, a total of 4.7 gm. of morphin hydrochloride. The following table gives the materials examined, the amounts of drug recorded and the percentages of drug administered found:

TABLE VIII

Materials	Found morphin, pure	Percent of morphin administered found	Total percent recoveries
Whole urine	0.3014	8.34	
Whole feces	0.1124	3.11	
Blood 70 cc	0.0050	0.13	
Intestinal contents	0.0200	0.55	
Intestines			
Stomach contents	0.0220	0.60	
Stomach			16.36
Whole muscles	0.1300	3.59	
Liver			
Kidneys			
Lungs	0.0015	0.004	
Heart			
Whole			

"From Table VIII it will be seen that morphin in acute intoxication was recovered up to 90 per cent, but in the chronic morphinism, only 16.36 per cent of the total amount of the injected morphin could be recovered. Thus it will be seen that the largest portion of morphin had disappeared, which could not, we believe, be due to the experimental error or loss. If the percentage of the recovered morphin had amounted to 70-80 per cent, the difference might be explained as due either to experimental loss or to error, arising from the fact that the experiment covered a long period of time, but only 16.36 per cent of the total amount was too small for that, but might rather be considered to be the results of the destruction in vivo."

Their résumé and conclusions derived from their findings in the morphinized animal are as follows:

"10. In chronic morphinism, morphin is gradually destroyed in the body, and therefore the animal body gradually acquires a tolerance to it.

"11. In chronic morphinism, the muscle contents of morphin increase markedly while on the other hand the viscera become almost free from it.

"12. In chronic morphinism the morphin content of the blood is found to be larger than that of an equal volume of blood in acute cases.

"13. In chronic morphinism the estimation of the percentage of the morphin contents of the whole body against the amount injected for the last time is meaningless, because we have reason to believe that some of the amount injected before the last might be present in the contents of the stomach and intestine, and the muscle tissues.

"14. In chronic morphinism, the excretion of morphin which has been taking place during the process of time until the development of the chronic intoxication phenomena, chiefly has occurred through the kidneys, and we found that the morphin contents of the urine were by far higher than those of the feces.

"15. In chronic morphinism the protection of the living organism against that poison consisted in the fact that a large amount of morphin which had been introduced once into the body is reserved in the muscles, while on the other hand the destruction takes place in the body and also excretion occurs through the kidneys and stomach.

"16. From the above résumé, we venture to conclude that morphinism is due to the acquired power of the living organism to destroy morphin and to excrete it, besides the augmented power to reserve it in large amount by the muscles, so that even though a large amount of it should be introduced into the body all at once, it can be prevented from immediately attacking the central nervous system."

I. H. Pierce and O. H. Plant—1928.[83] [84]

In the second of a series of articles dealing with studies in chronic morphin poisoning in dogs, the authors report findings resulting from studies of blood cells and hemoglobin in dogs during addiction to morphin and during withdrawal. They state:

"It seemed worth while to study the blood cells and hemoglobin in dogs during chronic morphine poisoning and withdrawal for two reasons: (a) the pathology of chronic morphine poisoning is not understood and therefore data on any demonstrable pathologic change is of value and may ultimately aid in finding the fundamental alterations that make it a disease; in spite of the fact that a large majority of those who have worked on the morphine problem believe that morphine addiction is a true disease, the question will always be raised as to its being such, until the fundamental changes that underlie it are thoroughly understood. (b) Since dogs seem to be very suitable test objects for studying experimentally many phases of chronic morphine poisoning, comparison of data obtained on them with similar data from human subjects adds to the value of all observations made on these animals.

"We have made counts of red and white cells and have estimated hemoglobin content throughout addiction and during withdrawal in 16 experiments on 12 dogs (12 first addictions and 4 second addictions). In addition to the above, similar studies were made on three dogs that died, two during addiction and one on the third day of withdrawal. Differential leucocyte counts were made throughout 8 of the above experiments. The general treatment of these animals and data concerning weight, food, dosage, behavior and symptoms are given in the paper which precedes this one."

---

[83] Pierce, I. H., and Plant, O. H.—Studies in chronic morphin poisoning in dogs. II. Changes in blood cells and hemoglobin during addiction and withdrawal.

[84] Pierce, I. H., and Plant, O. H.—Studies in chronic morphin poisoning in dogs. III. Blood sugar during tolerance and withdrawal.

Through the courtesy of the authors and of the editor of the American Journal of Pharmacology, in which these articles will appear, we have been enabled to publish the abstracts and quotations included in this volume.

The observations were begun from two to four weeks before addiction started and examinations of blood were made once a week during this period and during addiction. During withdrawal daily examinations were made and as withdrawal progressed from two to seven days elapsed between examinations. Blood samples were taken in the morning before the administration of morphin. The usual counting chamber for red and white cells was used, and the Dare hemoglobinometer for estimating hemoglobin. Wright's stain was used in making differential leucocyte counts. Cases in which intercurrent infections occurred were eliminated.

The following figure shows dosage, weight, hemoglobin and red and white cells during addiction, and withdrawal in dog 8, a typical case.

The authors summarize as follow:

"Studies of red and white cells and hemoglobin were made on sixteen dogs during addiction to morphine and after sudden withdrawal; differential counts of white cells were made on 8 dogs.

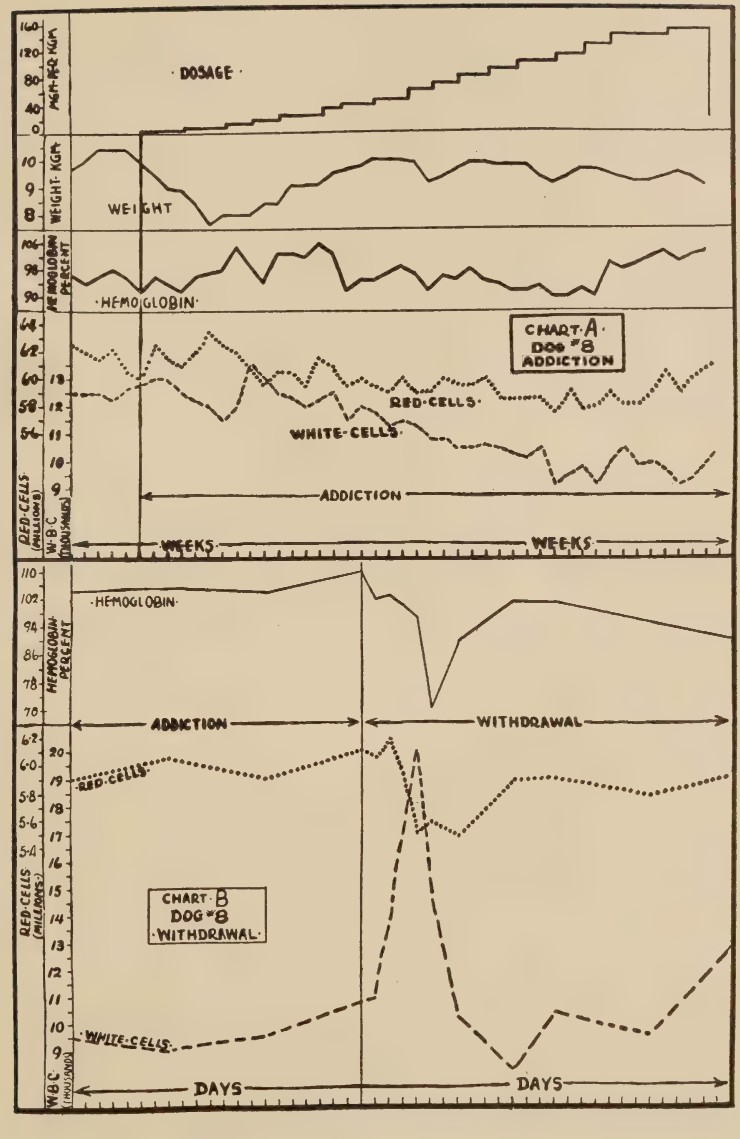
"Red blood cells are normally more numerous in dog's blood than in human blood; during addiction to morphine the number of red cells is not materially altered; following abrupt withdrawal the number is decreased.

"White blood cells are normally more numerous in dog's blood than in human blood; during addiction neither the number nor the relative amounts of the various forms of white cells show any consistent change; during withdrawal there is a marked leucocytosis and during the leucocytosis the percentage of polynuclear neutrophiles is increased.

"The hemoglobin content of dog's blood is not altered during addiction to morphine; during withdrawal the hemoglobin is usually decreased, the fall being parallel to the decrease in red cells."

In the third article, dealing with their studies of morphin intoxication and withdrawal in dogs, the authors give the following as their objects:

"(a) It was shown by Ross, 1918, that single doses of morphine produce hyperglycemia in dogs, and Luzzato, 1905, demonstrated that the acute effects of morphine are accompanied by glycosuria. Because of the well established relationship between liver function and blood sugar, we hoped to obtain at least presumptive evidence as to whether or not the liver developed tolerance to morphine, by following the variations in blood sugar throughout continued administration of the drug and during withdrawal. That some functions affected by morphine do not develop tolerance during prolonged administration was shown by van



160
120
80
40
0
MGM-PER-KGM
·DOSAGE·
10
9
8
WEIGHT-KGM
WEIGHT
106
98
90
HEMOGLOBIN PERCENT
·HEMOGLOBIN·
CHART·A·
DOG #8
ADDICTION
64
62
60
58
56
13
12
11
10
9
RED-CELLS·
WHITE-CELLS·
ADDICTION
RED-CELLS (MILLIONS)
W·B·C (THOUSANDS)
WEEKS
WEEKS
110
102
94
86
78
70
·HEMOGLOBIN·
HEMOGLOBIN PERCENT
ADDICTION
WITHDRAWAL
6·2
6·0
5·8
5·6
5·4
20
19
18
17
16
15
14
13
12
11
10
9
RED-CELLS
CHART·B
DOG #8
·WITHDRAWAL·
·WHITE-CELLS·
RED-CELLS (MILLIONS)
W·B·C (THOUSANDS)
DAYS
DAYS

FIGURE. I.

Egmond, 1911, with regard to the vagus control of the heart and by Plant and Miller, 1926, in connection with the effects on muscular activity of the small intestine.

"(b) The second object was to determine whether or not a condition of hypoglycemia exists during withdrawal. Some of the withdrawal symptoms in man suggest this possibility. Also, in an experiment on a dog in this laboratory, in which a moderate degree of tolerance was developed, some of the symptoms during withdrawal, especially the marked muscular weakness and tremor, seemed to indicate that hypoglycemia might be a factor in producing them.

* * * * *

"Our animals were all females, of many different breeds, and varied in weight from 5.5 to 18 kgm. They were fed on a uniform diet of raw pig hearts and dog biscuit, with liver and bone meal once a week. The animals were kept in clean, well ventilated kennels, with a daily period of exercise in an outside runway. Each dog received a weekly bath with cresol soap and before the experiment started was given powdered areca nut to get rid of intestinal parasites.

"Several normal animals were kept in the same environment and received the same general treatment as the addicted dogs. Regular blood sugar estimations on these animals served as general controls.

"All of the addicted dogs were kept in the environment and under conditions that prevailed during the experiment for periods of 3 to 6 weeks before the administration of the drug was begun. Blood sugar estimations during this period served as controls for the individual animals. Most of our animals were addicted slowly and administration of the drug was continued over a long period. . . . The initial dose was 5 or 10 mgm. of morphine sulphate per kgm. This dose was continued until vomiting no longer occurred after the injection and the animal was again taking enough food either to maintain its weight or to regain some of the initial loss; this required from 2 to 4 weeks. Subsequent increments in dosage were governed largely by the dog's general condition as indicated by the weight curve. If the animal was maintaining its weight the dose was increased at intervals of one to three weeks, if losing weight the intervals were longer—3 to 5 weeks, and if the loss in weight continued the dose was reduced. By following this plan we were able to maintain the animals in good condition throughout the experiments and thus avoid marked changes in blood sugar due to poor nutrition. Figures giving the average weight of each animal during control period and during the first and second halves of addiction are shown in tables I and II, and a typical weight curve is shown in figure I."

The authors continue:

"Two types of blood sugar curves were studied during addiction: (a) the general blood sugar level as shown by weekly examinations throughout the period of continued administration; these estimations were invariably made just before the dose was injected and represent, therefore, the low point in the blood sugar in so far as the effect of morphine is concerned. (b) At frequent intervals during addiction the immediate rise in blood sugar following the injection was studied in detail by taking samples of blood at intervals of 1½ to 2 hours during the day. The purpose of making these detailed studies of the rise in blood sugar that follows immediately after the injection was to ascertain whether this rise continued as tolerance developed, that is, whether the liver, or whatever mechanism is responsible for the rise, develops tolerance to morphine.

"During withdrawal the general level of blood sugar was determined at first by daily examinations; as the animal recovered from the immediate effects of withdrawal, blood sugar estimations were made at longer intervals, (3 to 7 days). Withdrawal was abrupt."

After recording in detail their observations during different periods of addiction and withdrawal, the authors comment and summarize as follows:

"COMMENT

"We believe that the rise in the general level of blood sugar during the first half of a long addiction is a direct effect of morphine and is not dependent on the effect of diminished food intake as evidenced by the loss in weight during this period, because (a) it has been shown that during starvation the blood sugar falls steadily until a greater percentage of the body weight is lost than ever occurred in our dogs, and (b) this rise in blood sugar lasted longer than the period during which the animals were losing weight. The resumption of a normal and in some cases a lower blood sugar level during the second half of a long addiction is therefore an evidence of the development of more complete tolerance by the sugar regulating mechanism.

"The results of our experiments indicate that the hyperglycemia which occurs immediately after the injection of morphine in a non-tolerant dog is not dependent upon the fall in body temperature, because it disappears during addiction at a time when the fall in temperature still occurs after each dose. It is not due to the narcosis and the consequent decrease in muscular activity because it disappears at a time when the animals still remain very quiet after the injection even though they do not sleep soundly.

"We believe that the disappearance during addiction of the hyperglycemia which occurs immediately after the injection is presumptive evidence of the development of tolerance by the liver, because (a) of all the factors concerned in blood sugar regulation the liver is the most important, cf., Macleod, and as addiction proceeds the blood sugar approaches more and more closely a constant level; (b) there is no question but that the narcosis is dependent on the action of morphine on the central nervous system, and the experiments of Gottlieb furnish strong evidence that the fall in temperature is due to the effect of the drug on the central heat controlling mechanism. The hyperglycemia disappears during tolerance much more rapidly than either the narcosis or the fall in temperature, and further, it reappears more rapidly than either of these effects when the drug is withheld temporarily during addiction.

"SUMMARY

"During the first half of a long addiction to morphine the general level of blood sugar, as shown by estimations made before the injection of the daily dose, is somewhat higher than during the control period before addiction started. During the second half of a long addiction the general level of blood sugar is lower than during the first half and either approaches or is slightly below the normal level.

"The hyperglycemia that occurs immediately after the injection of morphine in a normal dog, rapidly disappears during addiction. The fall in temperature that occurs simultaneously with the hyperglycemia decreases very slowly and does not entirely disappear during addiction.

"When the drug is withheld for two to four days during addiction, the hyperglycemia recurs to approximately the same degree as after the first dose, when administration is resumed; the fall in temperature is not as great proportionately as the hyperglycemia.

"The blood sugar curve shows a distinct increase during the first week of withdrawal. Later in withdrawal, after withdrawal symptoms have subsided, the blood sugar curve falls somewhat below normal, in some cases."

CHAPTER VI

PATHOLOGY *(continued)*

TOLERANCE—DEPENDENCE—WITHDRAWAL

Whatever the school of thought as to the general nature of chronic opium intoxication and whatever the theory advanced in explanation of its mechanism, every one is agreed that individuals in this condition can take increasingly large amounts of the drug, amounts that would be fatally poisonous to the unaccustomed individual. This characteristic commonly is designated as tolerance and indicates an artificially established resistance or immunity to the drug in question.

In order for tolerance to be established, a variable period of time is required and the increase in dosage as a very general rule must be quite gradual in the beginning. The degree which this tolerance may reach is very great and practically every text-book cites cases in which, in comparison with the usual minimal fatal dose, this tolerance has reached an astounding point. Such cases, however, while of passing interest, have no especial significance, as they indicate, in degree only, a difference in the ability to withstand poisonous doses.

This tolerance constitutes the only fundamental characteristic of chronic opium intoxication that is generally conceded. There are those, however, who include as an important and universally present feature and as developing *pari passu* with tolerance an organic or functional dependence, as evidenced by the withdrawal phenomena, which requires the continuous taking of the drug in order to maintain equilibrium or a state of being which to the individual concerned, is normal. Others, admitting the existence of tolerance, deny or minimize the development of a dependence and claim that the withdrawal symptoms evident upon stoppage of the drug are simulated or if existing at all exaggerated in order to obtain the drug.

Before presenting the reports of work dealing with tolerance, it seems advisable briefly to consider a question concerning which there has been some disagreement, namely, the ability of codein to stimulate the development of addiction. Acknowledging that the crude drug and its derivatives, morphin and heroin, possess this characteristic, certain writers, however, deny that it is possessed by codein. In other words they claim that as an evidence of dependence the withdrawal phenomena observed in abstinence from other opium preparations do not appear in the case of codein withdrawal or they are so slight in degree that they require no special consideration.

The controversy arising from this difference of opinion seems to have centred chiefly around two points,—first, whether or not codein is a desirable substitute for morphin or heroin in the treatment of chronic intoxication to these drugs by lessening very materially the withdrawal phenomena and by being itself easily discontinued; second, whether or not codein should be included in the restrictions thrown around the distribution of opium derivatives, in view of the alleged absence of the qualities possessed by other opium preparations. Thus, the report of the Committee on Narcotic Drugs of the Council on Health and Public Instruction of the American Medical Association, composed of Drs. Haven Emerson, George W. McCoy, Thomas S. Blair, and Alfred C. Prentice, made at the 1921 meeting of the Association in Boston,[1] included the following item among its opinions presented for consideration:

> "4. The use of apomorphin and codein rarely if ever leads to the development of addiction to these drugs. Their physiological effects are such as to preclude the probability of their becoming of any importance as habit-forming narcotic drugs. The committee recommends that the American Medical Association respectfully urge on Congress such amendment of the Harrison Law as will permit the prescribing of apomorphin and codein by physicians without limitations which it is recognized as suitable to impose on those prescribing other habit-forming narcotic drugs."

The report of this committee was commended by the Reference Committee on Reports of Officers which recommended its continuance. The report of the Reference Committee was adopted by the House of Delegates.

Kengla,[2] 1895, reports the treatment of a case of morphinism where the morphin was rapidly reduced and codein substituted. He states that in several weeks the patient was getting nothing but water hypodermically. This case was an office patient. The patient is reported as having suffered but very little.

---

[1] American Medical Association—J. A. M. A. June 11, 1921. Vol. 76. No. 24. pp. 1669-1671.

[2] Kengla, L. A.—Codein in the Treatment of the Morphine Habit. Occidental Med. Times. 1895. IX. pp. 541-544.

Bouma,[3] 1903, reasoning from the experiments of Faust that the virtually complete recovery of injected oxalic acid in the excreta of dogs explained the fact that tolerance to this substance was not developed and that conversely the ability of the organism to destroy morphin accounted for the tolerance to this drug which his animals developed, undertook to show whether tolerance to codein appeared after continued administration over a long period and whether, provided such tolerance was produced, the organism could acquire an increasing ability to break up and destroy the codein. He records the details of his experiments on dogs and comes to the following conclusions:

> "It is seen that 4/5 of the codein injected is excreted in the urine and feces, mainly with the former, that on continued administration of codein the organism does not develop the ability to destroy the codein, and that instead of a chronic intoxication to this substance rather an increased sensitiveness appears.
>
> "If we compare the behavior of the organism toward the two substances which are so closely related chemically, morphin and codein, we shall find that the hydroxyl group of morphin esterized in codein forms the basis for the fermentative and oxydizing splitting off, which leads to the destruction of the morphin molecule. Also in my codein experiments the organism could create no new factors for the destruction of the codein.
>
> "According to the results of my experiments as well as the tests made by Faust in his experiments with oxalic acid, it is indisputably shown that an explanation of the fact that chronic intoxication does not appear after the continuous administration of codein may be sought in the inability of the organism to destroy this morphin derivative."

Babel,[4] 1905, found that a pigeon, which had been treated with morphin for ten months and was able to tolerate a dose greater than the minimal lethal dose, died four hours after the injection of a dose of codein.

Sollier,[5] 1905, states:

> "We too often forget that the derivatives of opium are all the same from the point of view of intoxication and that they do not differ at all from the point of view of tolerance and of the patient's resistance, except as a result of the method of their introduction into the body."

---

[3] Bouma, J.—Uber Gewohnungsversuche mit Kodein. Arch. f. exp. Path. u. Pharm. 1903. Vol. 50. pp. 353-360.

[4] Babel, A.—Uber das Verhalten des Morphiums und seiner Derivate im Tierkorper. Arch. f. exper. Path. u. Pharmakol. 52: 262-270. 1905.

[5] Sollier, P.—Heroine et Héroinomanie. Press Méd. Nov. 4, 1905. No. 89. pp. 716.

In 1920,[6] in commenting on the use of substitutes for morphin during suppression, he states that the use of such drugs is based on the erroneous assumption that there are substitutes for opium. In whatever form this latter occurs, nothing can replace it and this must not be forgotten. Such substitutes are, however, frequently advocated by fallacious statements which offer certain opiate preparations as inoffensive and above all incapable of setting up tolerance,—a mistake no less disastrous because there is no derivative of opium, not a single opiate preparation whatsoever, which does not inevitably lead to chronic intoxication.

In more recent correspondence Sollier again emphasizes this fact in the following paragraph:

> "There is no derivative of opium, in spite of the pretended virtues of pantopon, paveron, opon, etc., which does not produce tolerance under the same conditions as morphin."

In 1913 [7] Sollier reported a case of pure chronic codein intoxication, stating that although codein in order of toxicity comes next to morphin but third as a soporific, it is not much used by these cases probably because its analgesic properties are slight. The case which he reports is that of a physician 72 years old who took codein for rheumatism reaching a daily dose after about 3 years' use of 2 grams. In treating this case Sollier reduced the drug more slowly than usual, taking 8 days to withdraw it entirely. The symptoms, he states, were the same as in morphin withdrawal, but less intense,—insomnia, sweats, bilious stools, nausea, weakness, pain in the legs, etc. Several crises occurred as did other symptoms during convalescence. Recovery occurred as in the case of morphinists. At the end of 4 weeks the patient slept 5 or 6 hours at night. He states that the withdrawal symptoms are the same for all derivatives as are the symptoms of intoxication. The duration of the body's reaction to withdrawal is practically the same for all opium preparations and the return of the body functions to normal occurs in the same order. The elimination of codein is accompanied by the same phenomena as that of morphin and progresses in the same way with eliminatory crises.

---

[6] Sollier, P.—Àpropos de la Chimiothérapie du Morphinisme. Bull. gen. de Thérap. 1920. Vol. 171.

[7] Sollier, P.—Un Cas de Codeinomanie pure. Rév. de Méd. Lég. 1913. XX. pp. 359-362.

Langer,[8] 1912, working on the recovery of heroin and the establishment of tolerance to this drug calls attention to the double action—narcotic and stimulating—which is seen in heroin and codein. He states that up to that time little work had been done toward determining how these two attributes are affected during continued injections. He states that the decreasing narcotic action observed in heroin is analogous to the action of codein as stated by Bouma. The latter, he says, while interested chiefly in the stimulating action of codein, noticed a gradual decrease in the narcotic action upon the continued administration of even doses. He assumes that Bouma used large doses in which the narcotic effect was effaced in some degree by the stimulating effect, but states that Bouma should have observed—if no tolerance to the narcotic component appeared—the struggle between narcosis and stimulation described by Schroeder in the higher doses as well. He points out the desirability of carrying out further experiments with smaller amounts of codein while studying from the clinical aspect tolerance to the narcotic principle of this drug. This partial tolerance to the narcotic property of morphin ether and ester, he states, is not easily reconciled with the hypothesis that tolerance to morphin depends alone on an increasing disintegration in the body.

Pettey,[9] 1913, says as to the development of tolerance to codein:

> "The only essential difference presented by users of various preparations of opium is in the time required for the disease to be confirmed, and in the prognosis. One of these differences is that codeine and heroin can be used for a longer period without formation of addiction than any of the other preparations of opium."

Lambert,[10] 1914, says:

> "A few cases of heroin and codeine addiction have come under the writer's care, one patient taking 30 grains of codeine a day."

In 1915[11] he states:

> "The impulses leading to the addiction of codeine, morphine and opium arise from the desire for narcotic forgetfulness rather than for a stimulation of personality."

In 1922,[12] Lambert reports that in a series of 1,593 users of narcotics studied by him 17 "had the codein habit."

---

[8] Langer, H.—Ueber Heroinausscheidung und-gewohnung. Biochem. Ztschr. 1912. Vol. 45. pp. 221-238.

[9] Pettey, G. E.—Narcotic Drug Diseases and Allied Ailments. 1913.

[10] Lambert, A.—Osler and McCrae's Modern Medicine. 1914.

[11] Lambert, A.—The Intoxication Impulse. Med. Rec. 1915. Vol. 87. pp. 253-259.

[12] Lambert, A.—Nelson's Loose-Leaf Medicine. 1922.

Myers,[13] 1915, from a study of cross-tolerance to codein, heroin, cannabis indica and chloral hydrate in dogs already tolerant to morphin, reaches the following conclusions:

> "1. A marked crossed tolerance exists to codein and to heroin in dogs habituated to morphine, in so far as effects upon the respiratory center are concerned.
>
> "2. A slight crossed tolerance exists between codein and morphine, and between heroin and morphine in regard to their actions upon the tissues governing equilibrium.
>
> "3. Dogs tolerant to morphine when given codein or heroin have increased intestinal peristalsis.
>
> "4. No evidence of crossed toleration to cannabis indica or to chloral hydrate exists in dogs tolerant to large amounts of morphine.
>
> "5. The experiments cited show that a cross tolerance may exist between closely related drugs but that this tolerance is evidenced only on those functions in which the drugs have a common selective action."

* * * * *

> "As far as this study shows, therefore, a crossed tolerance involves only those structures upon which the drugs exert effects mutually alike."

Wilcox,[14] 1917, states that codein is much less likely than morphin to produce addiction and in 1917 Potter[15] makes the same statement, while in 1918 Bastedo[16] states that codein is not "a vicious habit drug."

Cushny,[17] 1918, states:

> "No tolerance is acquired for codeine even after long use, and patients may in fact appear more susceptible to the drug, a dose which at first gave relief now causing nausea and vomiting. It is possible that this may indicate a tolerance of some parts of the central nervous system, which is not shared by the vomiting centre."

* * * * *

> "Codeine is much less often used than morphine in therapeutics. It is of comparatively little value in allaying pain or excitement, but has been found of benefit in the sleeplessness of melancholia. It is used not infrequently as a sedative in cough, and, as has been stated, in diabetes. There is little or no tendency to form the codeine habit, and it has been suggested as a substitute for morphine in morphinomania, but has not proved efficient in this condition."

---

[13] Myers, H. B.—Cross Tolerance. Altered Susceptibility to Codein, Heroin, Cannabis-Indica and Chloral-Hydrate in Dogs having an acquired tolerance for Morphine. Jour. Pharm. and Exp. Therap. August, 1916. Vol. VIII. No. 8.

[14] Wilcox, R. W.—Materia Medica and Therapeutics. 1917.

[15] Potter, S. O. L.—Therapeutics, Materia Medica and Pharmacy. 1917.

[16] Bastedo, W. A.—Materia Medica; Pharmacology: Therapeutics. 1918.

[17] Cushny, A. R.—Pharmacology and Therapeutics or the Action of Drugs. 1918.

White,[18] 1918, states in connection with the substitution of certain drugs in the treatment of chronic opium intoxication:

> "It is necessary to call attention to the danger of cocaine for this purpose. Codeine has also sunk into disuse and the synthetised derivatives of morphine, heroin, dionin and peronin cannot be said to be any better. Their use is founded on a wrong theory and is fraught with danger. Cases of serious addiction to codeine and heroin have been reported."

Baumm,[19] 1919, observed no chronic intoxication as a result of the use of eukodal, a new codein derivative, in about fifty cases.

On the other hand, Alexander,[20] 1920, reports a case of eukodalism.

Biberfeld,[21] 1920, reports on the effect of the codein derivatives, eukodal and parakodin, on a rabbit and a dog and concludes as follows:

> "1. Eukodal paralyzes the respiration much more strongly than morphin, but it is less poisonous than heroin; the general narcosis is likewise greater but more transient than after morphin.
>
> "2. Rabbits do not become addicted to eukodal (respiration and cerebrum), in dogs the sedative action quickly disappears upon repeated injections and the stimulating action peculiar to large doses then appears.
>
> "3. Parakodin acts more strongly on the respiration than codein, less strongly than eukodal and morphin; dogs exhibit an addiction to the sedative component of the action.
>
> "4. Eukodal and Parakodin paralyze the isolated rabbit intestine."

Watson,[22] 1922, reports on an original questionnaire study among the physicians of Maryland to the effect that from 700 replies to 1,250 inquiries "no case of codein habit had ever been seen in Maryland." He concludes:

> "Codein is one of our most useful and most commonly prescribed drugs. It is not a dangerous drug. No detailed account of a death from it has been found. No textbook gives the lethal dose. It apparently is not habit-forming. Known for ninety years, and extensively used for more than thirty years, only four cases of habit are mentioned in the literature. One of these cases is questionable, and the other three so easily cured as to make them negligible. Codein was used on an enormous scale in the United States for twenty-five years with-

---

[18] White, William A.—Outlines of Psychiatry. 1918.

[19] Baumm, F.—Unsere Erfahrungen mit Eukodal. Therap. Monatsh. 1919. Vol. 33. pp. 219-220.

[20] Alexander, A.—Ueber Eukodalismus. Munch. med. Wchnschr. 1920. Vol. 67. p. 873.

[21] Biberfeld, J.—Uber Gewöhnung an Kodeinderivate. (Eukodal u. Parakodin.) Biochem. Ztschr. 1920. Vol. III. pp. 91-104.

[22] Watson, William T.—Is codein a habit-forming drug? J. A. M. A. May 13, 1922. Vol. 78 (2) No. 19. pp. 1478-1479.

out restrictive laws, with apparently no habit formation. To a large extent, it displaces the use of morphin and heroin, which are habit-forming. Its inclusion in the Harrison law seemingly misbrands the drug and the physician who prescribes it, and imposes an unnecessary hardship on the physician, patient and druggist and useless expense on the government. Unless some as yet unreported evidence of habit comes to light, codein should be eliminated from the Harrison law."

Williams,[23] 1922, says:

> "Yet, if neither heroin nor morphin is available, the habitué can get a somewhat similar effect—can at least avert the worst phases of withdrawal suffering—by large doses of either codein or dionin. He would not have his suffering and craving entirely relieved, but would have them very decidedly mitigated. And if the use of these drugs were continued, he would presently reach a stage in which he would be comfortable and without the old craving so long as his system was saturated with codein or dionin. This condition would be a very decided step toward recovery, because codein and dionin do not produce a 'habit' of any such intensity as do morphin or heroin, and may be quickly reduced and withdrawn without any very great discomfort to the patient."

Gunn,[24] 1923, in a review of the literature on tolerance to non-protein substances, states:

> "Habit and tolerance are common in man to heroin, rare to codeine."

* * * * *

> "To sum up the question of acquired tolerance to these morphine alkaloids, it may be said that tolerance is acquired easily to morphine, less easily to heroin, and with great difficulty to codeine."

Rogues de Fursac and Monestier,[25] 1924, report the development of addiction to codein in a young woman who was given codein and potassium iodide in the course of treatment for asthma. The codein caused in this case a distinct euphoria which led her, as tolerance developed, to increase the dose up to 1.0 g. a day. Menstruation ceased as the higher doses were reached. Treatment induced withdrawal symptoms milder in degree than those usually seen in cases of morphinism, but characteristic in type—insomnia, diarrhea, cramps in the leg muscles, etc., and return of menstruation.

The authors question, in view of the occurrence of such cases, the wisdom of excluding codein—under the French law of 1916—from the regulations governing the sale and distribution of other opium alkaloids.

---

[23] Williams, E. H.—Opiate Addiction: Its Handling and Treatment. 1922.

[24] Gunn, J. A.—Cellular Immunity: Congenital and acquired Tolerance to non-protein Substances. Physiological Review. Jan., 1923. Vol. 3. pp. 41-74.

[25] Rogues de Fursac, J. and M. Monestier—Un Cas de Codéinomanie. Annales de Médecine Légale. March 1924. Vol. 4. No. 3. pp. 119-124.

Sollman,[26] 1926, in comparing morphin and its esters, says:

"In principle, all morphine esters are presumably capable of producing addiction; but practically the difference between them is very large. This depends on the quantitative response: the more powerful is the narcotic effect of the alkaloid, the more easily is the habit induced and carried on, and the more difficult is it to break. Heroine is rather more powerful than morphine, and the addiction is consequently somewhat more serious. The narcotic action of codeine is so slight that it is not very tempting to addicts, and really narcotic doses would be inconvenient to administer, and disproportionately expensive, so long as its sale is restricted. If restrictions were removed, however, so that it could be procured in unlimited quantities the situation might become very different. With medicinal doses of codeine, the psychic effects are so slight that they would scarcely be recognized by the patient; and there is therefore no temptation to increase the dosage; and the codeine can be withdrawn without much reaction on the part of the patient.

* * * * *

"*Codeine Addiction.*—The rarity of this may be judged by the report of Watson, 1922, that replies from 700 physicians, including sanitaria and prisons, do not record a single case of codeine-addiction. Only three cases are found in the literature, and these were so mild that they could be broken in a few days without marked abstinence symptoms. The dose recorded was 2 gm. per day (cf. also Pelz, 1905; Petteys).

* * * * *

"*Derivatives of codeine* with more marked narcotic action produce addiction ('eukodal' and 'parakodin'; Biberfeld, 1920 and 1921). The acquired tolerance does not extend to the convulsant action."

In a report by Terry,[26a] 1927, on studies conducted by J. W. Cox for the Committee on Drug Addictions, dealing with the per capita use of opium, coca leaves and their derivatives, and the variations observed in the per capita figures, two cases of codein addiction are recorded as follows:

"Inquiry among the Montgomery physicians as a whole failed to indicate experience with codein addiction or belief in its existence except in one instance. This physician reported in detail two cases of codein addiction, the main features of which follow.

---

[26] Sollmann, T.—A manual of pharmacology. 1926.

[26a] Terry, C. E.—To the Committee on Drug Addictions. A further study and report on the use of Narcotics under the provisions of federal law in six communities in the United States of America, for the period July 1, 1923 to June 30, 1924. New York, 1927.

> "The first case, a man thirty-seven years old, had been addicted to the use of codein for about twelve years. During this time he had used no other opium derivatives, excepting for a short period during the survey year, 1923-24, when he supplemented his codein with morphin. When, however, the federal agents interfered with his orders for morphin he returned to the use of codein alone. He used, during the survey year, 4,108.5 grains of codein sulphate, about eleven grains a day.
>
> "The other case was a woman, forty-four years old, who was known to have been using codein hypodermically since 1918. For the first year or two it was understood that she used one grain daily. During 1922 and 1923 she used about two grains a day, and in 1925 she was using four grains a day.
>
> "Both of these cases, their physician stated, had been treated unsuccessfully and when withdrawn from the codein showed the same symptoms as those resulting from morphin abstinence, presenting the same difficulties of treatment and the same tendency to relapse."

To return to the main subject under discussion, the reader will find the most important opinions as to the mechanism of chronic opium intoxication as evidenced by tolerance, dependence, and withdrawal symptoms, whether or not supported by evidence comprised in records of experiments or observations, set forth below. However, we would point out that we are handicapped in attempting to cover this material, an appreciation of which depends to a very great degree upon the correct interpretation of highly technical laboratory methods and procedures. It is manifestly impossible, however desirable it may be from some viewpoints, to quote in full the details of technique of the individual experiments. We have sought, therefore, in the brief presentation which follows merely to acquaint the reader with the chief theories and pieces of work relating to this important aspect of the problem, hoping to stimulate both a more critical review of the complete works quoted and original speculations.

W. Marmé—1883.[27]

In a study of the fate of morphin in morphinized dogs, Marmé detected the presence of oxydimorphin in an extract of the lung and liver and came to the conclusion that morphin in chronic intoxication is changed to oxydimorphin, a toxic substance causing, when not neutralized by further morphin, the abstinence symptoms. Marmé maintains that on the injection of a sufficiently large quantity, oxydimorphin produces symptoms similar to those exhibited on the withdrawal of morphin from a morphinized body. From these observations Marmé appears to conclude that the oxydimorphin requires increasing amounts of morphin to neutralize its toxic action and on the other hand neutralizes the effect of the morphin.

---

[27] Marmé, W.—Untersuchungen zur acuten und chronischen Morphinvergiftung. Deutsche Med. Wchnschr. 1883. Vol. 9. pp. 197-198.

According to Du Mez:[28]

> "This theory, however, appears to be untenable in view of the fact that Donath,[29] Stark[30] and Marquis,[31] respectively, operating under similar conditions, could not identify oxydimorphin in either the blood or urine of dogs in which tolerance to morphin had been established. Furthermore, it has been shown that oxydimorphin prepared from morphin with the aid of certain plant juices (Bougault[32]) or by the action of various oxidizing agents in alkaline solution (Schutzenberger,[33] Nadler,[34] Polstorff[35]) does not possess the properties assigned to it by Marmé. Magendie[36] found it to be inactive when administered by mouth to dogs in doses of 0.36 grain, while Kreis[37] observed that it had a very weak morphin-like action. When given intravenously, the latter found that it produced weakness which soon developed into stupor. Toth[38] found it to be inactive when administered by mouth or subcutaneously. He attributed the effects observed by Marmé to emboli, formed, in his opinion, as a result of precipitation which occurred when oxydimorphin was injected into the blood stream. Additional investigations demonstrating the relative inactivity of oxydimorphin and the erroneousness of Marmé's conclusions have been reported by Kobert,[39] Diederich,[40] Puschmann,[41] and Gioffredi."[42]

---

[28] Du Mez, A. G.—Increased Tolerance and Withdrawal Phenomena in Chronic Morphinism. J. A. M. A. April 12, 1919. 72: 1069.

[29] Donath, J.—Das Schicksal des Morphins im Organismus. Arch. f. d. ges. Physiol. 38: 528-548. 1886.

[30] Stark, E.—Untersuchungen Uber die Gewöhnung des thierischen Organismus an Gifte; Inaug. Diss. Erlangen. 1887; cited by Faust, Arch. f. exper. Path. u. Pharmakol. 44: 225, 1900.

[31] Marquis, E.—Ueber den Verbleib des Morphins im thierischen Organismus, Pharm. Ztschr. f. Russland, 35: 549-552. 1896.

[32] Bougault, J.—Oxydation de la morphine par le suc de Russula delica, J. de pharm. et de chim. 16: 49-52. 1902.

[33] Schutzenberger, M. P.—Note sur quelques produits d'oxydation de la morphine sous l'influence de l'acide azoteux. Compt. rend. Acad. d. sc. 46: 598. 1858.

[34] Nadler, G.—Ueber die Bildung des Oxymorphins bei vorsichtiger Oxydation des Morphins, Schweiz. Wchnschr. f. Pharm. 11: 417-419, 1873, 12: 38-42. 1873.

[35] Polstorff, Karl—Die Einwirkung des Kaliumferricyanids und anderer schwacher Oxydationsmittel auf Morfin und "das Oxymorfin Schutzenberger's" Arch. d. Pharm. 217: 401-424. 1880.

[36] Magendie—Cited by Reil, Materia Medica, Berlin, 1857, p. 257.

[37] Kreis—Cited by Herrmann, Lehrbuch der experimentellen Toxikologie, Berlin, 1874, p. 381.

E. Hitzig—1892.[43]

In a report on the relation between morphin withdrawal symptoms and the stomach, stimulated by the observation of symptoms of morphin poisoning in a dog that had fed on the vomitus of another dog suffering from acute morphin poisoning, this author experimented with a patient in withdrawal and determined that about half of the morphin introduced hypodermically was eliminated through the stomach and that in withdrawal there was a relative hyperacidity, which, he stated, was responsible for many of the disagreeable symptoms which occur in this state. He further speculates as to the possible reflex origin of other symptoms than those relating to the stomach, having their origin in the stomach nerves which, he states, are subjected to the effect of morphin by reason of the rapid passage of the blood into this organ.

C. Gioffredi—1897-1900.[44] [45] [46]

Gioffredi claims that "all will admit that morphin tolerance can be explained in two ways: (1) It is either due to a morphological or simply a functional modification of the nervous system in such a way that it does not react to the drug in the same manner and to the same degree; (2) or that the organism has acquired the power of rendering the poison harmless either by rapid elimination of the drug, destroying

---

[38] Toth, L.—Bemerkungen zur Erklarung der chronischen Morphiumintoxikation, Schmidt's Jahrb. 229: 135, 1891.

[39] Kobert, R.—Lehrbuch der Intoxikationen, Stuttgart 2:995, 1906.

[40] Diederich, Georg—Ueber Oxydimorphine und seine Wirkungen auf den Organismus, Diss. Gottingen, 1883; cited by Kobert, Lehrbuch der Intoxikationen, 2: 996, 1906.

[41] Puschmann, A.—Ueber Oxydimorphin und seine Wirkung auf den tierischen Organismus: Diss. Gottingen, 1883; cited by Kobert, Lehrbuch der Intoxikationen, 2: 996, 1906.

[42] Gioffredi, Carlo—Recherches ultérieures sur l'immunisation pour la morphine, Arch. ital. de biol. 31:398-411, 1899.

[43] Hitzig, E.—Morphium Abstinenzerscheinungen und Magen. Berl. Klin. Wchnschr. 1892. XXIX. pp. 1237-1240.

[44] Gioffredi, C.—L'Immunité artificielle par les Alcaloides. Arch. Ital. de Biol. 1897. V. 28. pp. 402-407.

[45] Gioffredi, C.—Récherches ultérieures sur l'Immunization pour la morphine. Arch. Ital. de Biol. 1899. V. 31. pp. 398-411.

[46] Gioffredi, C. L'assuefazione sperimentale alla Morfina. Gior. Intermaz. delle Scienze med. Napoli. 1900. V. 22. pp. 790-796.

it or by acquiring active immunity similar to the case of bacterial toxins."

In 1897 [44] he published a report of experiments which he carried on in this connection, in which he states that while it is impossible to obtain an immunity to cocain and atropin, it is possible to obtain with morphin a progressively increasing tolerance to very large doses, approaching a true immunity, if not identical with it. He also states, as a matter of still greater importance, that the serum of morphinized dogs has an antitoxic action of value in poisoning by morphin, sufficient to neutralize the effect of double the minimal fatal dose.

From these experiments he draws the following conclusions:

(1) It is possible to accustom the dog to withstand very high doses of morphin,—much greater than the minimal fatal dose—which closely resembles the artificial immunization to bacterial toxins.

(2) A specific antitoxin is formed in the blood of a dog thus immunized, which is capable of neutralizing the lethal action of a dose of morphin double the minimal fatal dose.

(3) While the antitoxin is being formed in moderate quantities, with increasing tolerance to morphin, the anatomical lesions common in slow poisoning are not entirely avoided.

(4) It is not possible to accustom dogs to cocain and atropin. But, on the other hand, they become more and more sensitive to their action and die before the minimal fatal dose is given.

In 1899 [47] following his original experiments on dogs, he continued the study in an attempt to explain the mechanism of this acquired immunity. After securing in a large dog a high degree of tolerance (7.5 g. morphin hydrochloride injected intravenously), he tested the antitoxic action of the serum of this animal in kittens which are more sensitive to morphin than are dogs. He found that a dose two and one-half times the minimal fatal dose could be rendered harmless in kittens.

> "But," he asks, "although antimorphin serum has marked antitoxic properties in experimental poisoning, would it also have a prophylactic preventive action like anti-diphtheritic or anti-tetanic serum, etc., in diphtheria and in tetanus?
>
> "This was a question whose importance was at once apparent and that it was necessary to solve; because only in the case of an affirmative answer could we compare immunization against a bacterial poison with immunization against a vegetable alkaloid. As a matter of fact, experiments carried on up to this

---

[47] Loc. cit.

time might more readily be considered in the light of pharmacologic antagonism between morphin and some substance in the antimorphin serum. If, on the other hand, the serum should confer for some time in kittens a preventive immunity against poisoning by morphin, it would have to be considered as entirely analogous to artificial immunity conferred against bacterial poisons."

As to its preventive action, he concludes from these experiments that when the serum is injected from ten to fifteen hours before the experimental poisoning, it protects kittens from fatal doses and that it appears as if the serum injection acts more efficaciously when given before the administration of the poison than when it is given at the same time. In certain cases the serum was able to neutralize the poison introduced ten days after the injection. He states, however, that the prophylactic effect is of but short duration, as it lasts only for from 10 to 15 days after the injection.

Further in a discussion of Marmé's theories as to the mechanism of tolerance and withdrawal symptoms, Gioffredi concludes on the basis of his experiments that the antitoxic properties of the serum of a morphinized dog are not due to the presence of oxydimorphin.

P. Sollier—1898.[48]

"The phenomena caused by morphin abstinence in cases of chronic opium intoxication have often been described, but we are yet to learn what they depend upon and through what mechanism morphin is eliminated from the body."

* * * * *

"The only theories which are worth being considered are those which are based on the chemistry of the morphinist.

"There are only two; and it is to be noted, however important this matter is, it has been neglected by most authors. The first originated with Marmé. This author claims that morphin is transformed in the body in contact with the oxygen of the blood into oxide of morphin; that this oxide is toxic and when it is injected into animals there are observed phenomena analogous to those of morphin abstinence. The symptoms noted at the time of withdrawal would, therefore, be due to this liberated oxide of morphin.

"There are two objections to this theory. It has not yet been proved that morphin is always and only changed into oxide of morphin in the body. Some investigators have found it in the form of morphin in the intestines of cases of long standing, which is surprising for so unstable a substance. In the analyses which I have had made by M. Winter of the fluids excreted at the time of withdrawal (bilious stools and vomitus), this view of the elimination of oxide of morphin was not confirmed but, even admitting this alteration in the body, there remains to be discovered why this oxide of morphin, which according to these theories accumulates in the tissues, causes no symptoms until one ceases to introduce morphin. Marmé states in explanation of this that the morphin recently injected neutralizes this oxide of morphin but this is an entirely gratuitous hypothesis. One cannot understand how the stored-up oxide of morphin, continually increasing in amount, can be neutralized by the regular amount of morphin. This explanation does not take into account, the reappearance of withdrawal phenomena in the form of crises, occurring more or less frequently and at intervals after withdrawal. Finally, poisoning by the liberated oxymorphin does not explain how the different symptoms are successively caused during withdrawal, while in experimental poisoning they are generalized and occur in all parts of the body at the same time. This theory, the chemical basis of which is but little substantiated, is therefore, entirely insufficient.

---

[48] Sollier, P.—La Démorphinisation. Mécanisme physiologique. Conséquences au point de vue thérapeutique. Presse Méd. Apr. 23 and July 8, 1898.

"The second theory, originated by Hitzig, is based on the fact demonstrated by Conrad and Alt that morphin in hypodermic injections quickly reaches the stomach, where it is partly eliminated, but under the influence of morphin saturation the stomach glands cease to function. When withdrawal is begun, their functioning begins again and a very acid gastric juice is secreted. There is a sort of inundation of gastric juice, loaded with hydrochloric acid, and it is, according to Hitzig, this hyperchlorhydria which causes the phenomena of withdrawal. Erlenmeyer, for this reason, advises a new method of treatment, having as its basis, the neutralizing with alkalines of this hyperchlorhydria, after having previously reaccustomed the stomach to withstand hydrochloric acid.

"This theory does not hold in the presence of the clinical facts. First of all, even if morphin does pass rapidly into the stomach, this does not prove that this is the principal and the quickest means of its elimination.

"Neither is it in the stomach that morphin is stored up, for the most part, as everybody today admits that this occurs principally in the liver and the brain. In what form? This is of little importance for the time being. Besides, it is not surprising, for it is exactly what takes place with most poisons. But even admitting that the stomach glands are saturated to the greatest degree and that under the influence of withdrawal of morphin they throw out large amounts of acid gastric juice, it must be admitted that this is a curious hyperchlorhydria which is accompanied by sneezing, lacrimation, muscular cramps, spermatorrhoea along with bilious vomiting, diarrhoea and profuse sweats, to say nothing of the inequality of the pupils, which is so common, the slowing of the pulse, which is constant, and the tendency to respiratory syncope. This second theory is no more satisfying than the first one.

"Let us see then if clinical observation will not teach us more than these theories which take into account only one more or less well demonstrated fact. Morphin continually used causes, after a while, a more or less marked lessening in the activity of the nervous system and an extremely marked reduction of the glandular secretions.

"Besides, one thing is especially striking: all the immediate phenomena of withdrawal and of demorphinization are characterized by the return of glandular functioning.

"The return of these functions does not take place at once in all of the organs at the same time. And if, at a given time, one observes at the same time symptoms of different kinds, once elimination is in full swing, one notices on the contrary that the different consecutive phenomena of withdrawal occur one after the other. Thus most frequently sweating or sneezing begin the scene along with yawning. Then the diarrhoea begins. At first, ordinary feces, then, very often, pure bile, then semi-bilious yellow diarrhoea. Mucus vomiting (gastric juice), then bilious (when there is any) only occurs when the diarrhoea has begun and stops before the latter does. Then follow the spermatorrhoea, salivation, cramps in the muscles. Each glandular apparatus thus comes into the scene in turn without there being any predetermined order in this succession of phenomena, which vary with each individual and in degree according to the saturation of the different organs with morphin.

"It is impossible to compare the poisoning produced by oxymorphin in healthy subjects with that which takes place, according to Marmé, when oxymorphin is liberated in morphinists, for the organs are not at all comparable in these two cases. The principal thing in the second instance is not the action of the oxymorphin on the organs but rather the elimination of oxymorphin by these organs.

"That oxymorphin causes general phenomena or symptoms in the case of certain organs such as the heart and respiratory apparatus, where morphin is not stored-up, I will admit. But that it causes the return of organic functioning, I cannot believe, unless this return of functioning is considered only to be due to the elimination of oxymorphin from the body. But the important thing, according to my way of thinking, is precisely this elimination of toxic products stored-up in the glandular apparatuses regardless of the nature of the products. In other words, instead of regarding the phenomena of demorphinization as pathologic and due to the poisoning, I regard them on the contrary as physiologic and due to the elimination of the poison which thus permits the return of glandular functioning. And this is so true that if, at the time of withdrawal, certain glands have not begun again to function, their return is preceded by evidence of localized secretion. The return of glandular functioning is absolutely the chief characteristic of demorphinization.

"Another clinical observation should be made; it is what takes place at the time when an evacuation is about to occur; it matters but little what organ is affected, the intestines, the stomach, salivary glands, etc. The patient is nervous, has a general feeling of discomfort, the heart is slow, the need of morphin or at least of some stimulant is felt. Then, as soon as the evacuation takes place, relief immediately follows.

"But if this premonitory discomfort were only a general discomfort, it might prove that the body was being poisoned by a new lot of liberated oxymorphin. But this is not the case; the discomfort is above all, local, and the painful sensation experienced by the patient is always of the same nature. It is a feeling of painful tension of engorgement. This engorgement is, besides, perfectly real and is shown in the liver, for example, which increases in volume and becomes painful to the point, often, of true hepatic colic. It is, therefore, the glands which are the seat of these phenomena and when their hyperemia ends, through an evacuation of their contents, the local discomfort and also the general discomfort ceases.

"What takes place in the glands and why do they begin to function again? Is there any need of invoking the toxic action of liberated oxymorphin? None at all. The withdrawal of morphin amply suffices to explain this phenomenon of returned functioning. In fact morphin acts on the glands in two ways,—by paralyzing the nerves which affected them and by saturating their cells, where it remains, probably changed. From the time the morphin injections are stopped what should happen and what in reality does happen? The nerves recover their activity; through other influences the glands begin again to function. But they are no longer in a normal condition. The cells of these glands and their excretory canals are modified, changed and unable after their more or less prolonged inactivity to secrete easily. The products of secretion experience difficulty in traversing the altered endothelium. Hence, the turgescence of the glands and the sensation of painful tension as when there is, for some reason or other, retention in a normal gland.

"But this is not all and the retention is still further increased by the fact that old and altered endothelial cells become detached in the *culs-de-sac* and obstruct them, and this obstruction is increased by a similar desquamation in the excretory canals which are thus more or less obliterated. This explains why, whenever there is an evacuation, there is immediate relief. This also explains why the heart is overworked and gives way when the effort of elimination occurs in many parts of the body at the same time.

"Hence, the renewed activity of the glandular nerves when the use of morphin is stopped; under this influence, there occurs marked formation of new cells of the glandular endothelium, desquamation of the superficial layers of this endothelium and of that lining the excretory ducts, glandular turgescence, painful production of secretory products, relief caused by the evacuation of these products—such is the group of phenomena which enables us to understand the symptoms of demorphinization.

"Do these successive phases correspond well to what happens and is this endothelial desquamation, which I believe I am the first to mention and to consider a matter of importance in the explanation of these phenomena, a real occurrence? To convince ourselves, we need only observe what takes place in the case of organs accessible to direct observation. From the beginning of withdrawal, the tongue which was clean becomes covered with a yellow white coating. This consists of nothing but dead superficial epithelial cells which become detached after a few days, leaving the papillae exposed; these are sometimes so denuded that they bleed. I have seen more than once in morphinists of long standing a furfuraceous or even scarlatinal desquamation when there have been profuse sweats, that is to say, when the sudorific glands have been much affected. There can also be observed, as I have done several times, similar phenomena of desquamation in the deeper organs such as the intestines giving rise to a pseudo-membranous enteritis. It is logical to suppose that the same thing happens in the whole glandular apparatus when the nature of the subjective and objective phenomena of one kind or another is seen.

"There is, therefore, no need of calling into play a special poisoning either by oxymorphin or by hydrochloric acid to explain the painful phenomena of morphin withdrawal and the different somatic symptoms that it prevents.

Suppose for a moment that what happens in mumps, for example, happened in all of the glands of the body at the same time or consecutively but quickly, and we would have the picture of morphin withdrawal. It all resolves itself into a physiologic mechanism corresponding to the anatomic changes in the tissues saturated with the morphin.

"But the interest in this point of view does not alone consist in supplying a simpler and more plausible theory for these phenomena. It allows us to explain easily the occurrences noted during demorphinization, such as the eliminatory crises, the advantage of rapid withdrawal, the uselessness and the danger of so-called sedatives or so-called substitutes, the gravity of relapse during a convalescence from a rapid cure; it allows us finally to establish the basis of a rational and truly pathogenic treatment for morphinism."

* * * * *

"*Eliminatory Crises.*—At the time of withdrawal, all the glands are the seat of a more or less abundant hypersecretion lasting for two or three days; then little by little this state subsides, when suddenly a state of discomfort, analogous to that of withdrawal but much less severe, occurs, which is accompanied by a new hypersecretion of one or more glands which brings relief. This crisis lasts twenty-four to forty-eight hours and following it, convalescence progresses more rapidly, organic activity is greater and certain apparatuses, which until then had been functionally inactive, take on again very active functioning.

"These crises may thus occur several times at very irregular intervals and in lessening degree during convalescence.

"Chemical theories are unable to explain this intermittence. Nor may poisoning by oxymorphin or the hyperchlorhydria at the time of withdrawal explain how, when withdrawal has been accomplished, phenomena analogous to those which accompany withdrawal again occur. Admitting, on the other hand, the mechanism which I have set forth, these things are easily explained and become a part of the general pathology. It amounts, as I have said, to a true epithelial and endothelial desquamation of the mucous membranes saturated with morphin, whose glands have ceased to function under this influence. At the time of withdrawal, a violent organic reaction, which causes the reawakening of glandular activity, leads to the elimination of the greater part of the cells which have been affected by the poison. But the underlying layers are not yet grown. They suffice for a certain period for the glandular functioning, but with the active growth of the deeper layers, the second layer of cells are, in their turn, thrown off whence is produced an eliminatory crisis analogous to that of withdrawal. The same phenomena thus occur several times just as happens in the skin affected by an infectious disease, as an eruptive fever. After the throwing off of the first epidermic layers, there is a throwing off of the underlying layers from time to time, until the skin has been completely renewed in its elements. Similarly, in demorphinization, this phenomenon takes place not only in the skin but in all the organs and principally in the glands; the stomach, intestines, liver, skin, etc. The eliminatory crises are nothing but consecutive desquamations of the glandular organs.

"It is interesting to see during how long a period these crises occur, for their termination corresponds to the return of the organs *ad integrum.* For from six weeks to two months after withdrawal they may occur and sometimes even longer. Hence, the necessity of keeping morphinists under treatment for at least six weeks, or risk exposing them to relapses. In truth, among the symptoms which occur with the appearance of these crises is seen the desire for morphin and it is easily seen how dangerous it is to leave a morphinist to himself, while he is subject to affections which are able to reawaken his desire for the drug."

E. S. Faust—1900.[49]

Faust believes there are two possibilities as to the way in which tolerance may be induced.

(1) By dulling the nervous system against the effect of the drug so that a given amount is no longer able to produce the same degree of reaction.

(2) By the creation in the body of an ability to make the morphin ineffectual either through transmission or destruction.

He endeavored therefore to find out which of the above was responsible for the acquired tolerance, by observing, in the case of dogs, how much of the consumed morphin was again excreted from the body.

On the basis of his experiments Faust reaches the following conclusions:

"Under normal conditions a portion of the injected morphin is destroyed in the body of the dog. From the feces the only excreta to be considered in relation to unchanged morphin, I could recover in acute poisoning only about 70 per cent. of the amount injected.

"On repeated injections the ability of the organism to destroy the morphin normally increased up to a certain degree. On further gradual increase of the dosage over a longer period of time, finally the point is reached where the whole amount of injected morphin is destroyed.

"However this ability to destroy the morphin is not unlimited.

"In those animals which were given gradually increasing doses daily, the action was the same as the above after larger doses.

"However, death followed the too rapid increase in the dosage, as in the case of morphinists and opiophagists under similar circumstances as long as the poison is not destroyed, its characteristic action develops.

"From these facts I have concluded that in so-called morphin-tolerance it is not a tolerance of the cells or a dulling of the cell toward the action of the morphin, but an increasing ability on the part of the organism to destroy the morphin.

"This conclusion is supported by the results of my oxalic acid experiments.

"Here we are concerned with a substance which under ordinary circumstances does not undergo destruction in the body. It was shown that even on the administration over a long period of time of gradually increasing doses no destruction of the oxalic acid took place. After 26 days—92-95 per cent. of the injected oxalic acid was recovered in the urine. Therefore the organism gave rise to no destruction. It was not able to create new factors under whose influence a destruction of the poison could have taken place."

---

[49] Faust, E. S.—Uber die Ursachen der Gewöhnung an Morphin. Arch. f. exper. Path. u. Pharmakol. 1900. Vol. 44. pp. 217-238.

L. Hirschlaff—1902-1903.[50] [51] [52]

Hirschlaff, in an article reporting experiments on animals aiming toward the production of an antitoxic serum analogous to the diphtheria and tetanus antitoxins for combatting morphin poisoning, rehearses how little work is available bearing on the production of immune serum in the case of simple plant poisons, especially those which have been defined chemically, stating that what is known about them is essentially of a negative character. He states that from the very accurate findings of Faust, with whose work he did not become familiar until after the completion of his own investigations, "it is more probable that the belief of the Ehrlich school in opposition to the antitoxin formation for alkaloids is incorrect at least respecting morphin."

Hirschlaff reports that he tested the protective action of the serum of morphinized rabbits first on a series of normal rabbits and later on a series of normal mice. Although the experiments with the normal rabbits appeared to be encouraging, he changed to mice for the reason that he found that his minimal lethal dose was too low in the case of the rabbits. From these experiments he concludes [53] that

> " . . . with long treatment of animals with increasing doses of morphin, protective substances are formed in the blood which are able to protect other animals from acute poisoning with a positively fatal dose of morphin or a multiple of the same, exactly analogous to the antitoxic sera which have been made against bacterial toxins."

Here Hirschlaff speculates as to the possibility of Ehrlich's side-chain theory offering an explanation of the mechanism of the phenomenon.

In a later, undated monograph [54] printed subsequently to a criticism of his theories by Morgenroth, in which he reports further experiments, Hirschlaff states:

---

[50] Hirschlaff, L.—Ein Heilserum zur Bekampfung der Morphiumvergiftung und ähnlicher Intoxicationen. Berl. Klin. Wchnschr. 1902. pp. 1149-1152; 1174-1177.

[51] Hirschlaff, L.—Zur klinischen Anwendung des Morphinheilserums. Ztschr. f. Krankenpfl. 1903. Vol. XXV. pp. 467-473.

[52] Hirschlaff, L.—Uber das Morphin-Heilserum. (Eumorphol-Riedel.)

[53] Loc. cit.

[54] Loc. cit.

> "On the basis of the results of these experiments, I thought I was justified in accepting the hypothesis that the basis for morphin tolerance in chronic morphinism must be found in a phenomenon analogous to that generally accepted today, in the immunity against infectious diseases according to Ehrlich's investigations. Therefore, I was led to the following consideration: If we accept the hypothesis that acute morphin poisoning takes place analogously to bacterial intoxication, that the haptophore group of the morphin molecule attaches itself to the side-chain of the body cells; if further, it is agreed, that in the case of chronic morphin tolerance, the receptors produced in excess by the body cells are thrown off and are then caught and broken up, as it were, in the blood and haptines freely surround the morphin, which is constantly being replaced, so that the toxophore group of the morphin molecule cannot now possibly get near the nerve cells, then the following theory concerning withdrawal symptoms, for the occurrence of which we have not yet been able to account theoretically, is explained by these hypotheses which are completely corroborated by facts. It can easily be demonstrated that new receptors are formed in the first stage of chronic morphin tolerance so that the organism can break up the morphin as it appears before it can reach the nerve cells. But the longer the abuse of morphin continues, the more this ability to produce side-chains is exhausted; therefore, disagreeable secondary reactions appear, because all of the morphin can no longer be made harmless and there is a continuous enhancement of the attraction, i.e., of the morphin necessary to produce a sufficient amount of side-chains. If treatment of morphinism is attempted in an organism in which the production of protective substances is lessened because the necessary attraction is lacking, then symptoms of poisoning must appear, since the whole amount of morphin, even though reduced, can no longer be bound by circulating receptors; and these withdrawal symptoms can be paralyzed only by either setting in motion the whip, which has heretofore caused the production of side-chains, viz.:—supplying quantities of morphin, or joining to the organisms the protective substances which are obtained from the foreign blood of animals, which were still producing side-chains at the time the serum was withdrawn."

As a further study of the protective action of the serum of morphinized animals, Hirschlaff reports that he carried on another group of experiments with about 150 rabbits and 400 mice.

The following table gives the results in percentages of Hirschlaff's experiments with the four groups of mice:

From this table, the author states:

> "It can be seen that the morphin sensitized serum exercises a weak but distinctly positive action against acute morphin poisoning of the mice, provided that the dose of morphin is not too large, i.e., that it lies between the M.L.D. and the dose *certe efficax*. The relatively high figures with which the normal

TABLE VII

Groups	% of total living	No. dead	% under morphin living	0.0012 g. incl. dead	% over morphin living	0.012 g. excl. dead
Morphin Mice	16.7	83.3	27.8	72.2	15	87
Normal Serum-Mice	30.3	69.7	50	50	15.8	84.2
Goat-Immune Serum-Mice	26.9	73.1	41.7	58.3	18.6	81.4
Rabbit-Immune Serum-Mice	45.1	54.9	65.5	34.5	31	69

serum mice in Table II (see above table) are concerned, are, as above noted, plausible and, for the greater part, to be accounted for by the fact that the number of these tests equals only about half of those of the other series."

* * * * *

"According to the way that I have supplemented and modified the results of my first experiments, I should like to raise the question as to whether the protective power of the morphin protective serum, which has been demonstrated experimentally to be positive, but always relatively slight, could not perhaps more readily be explained on a theoretical basis. In this connection, I should like the following to be considered:

"1. The chemically defined poison used, in this instance, to produce the protective bodies differs from the bacterial toxins in that, once introduced into the animal body, it does not multiply or increase in toxicity, so that the formation of the protective substance is limited by the impossibility to introduce more than, at the most, twice the absolute fatal dose, on the gradual increase of the poisoning in the animal. In the case of bacterial toxins where 100,000 times the absolute fatal dose can easily be introduced into the animal by gradual tolerance or immunization, for that reason, the protection obtained must be a correspondingly higher one.

"2. If the theory described above of the withdrawal symptoms on the basis of immunity is right—and it stands and falls naturally, with the proof of the protective action of the morphin serum—then the formation of protective bodies in the animals treated with increasing doses of morphin is dependent on their chemical behavior. In man, as you well know, ½-1 year goes by before the characteristic symptoms in chronic opium abuse appear as signs for the cessation of the formation of protective substances; the older the individual, the weaker the constitution, the more quickly the symptoms of opiumism or withdrawal appear. Somewhat similiar conditions obtain in animals. The formation of protective bodies can flourish in animals only when the state of health of the animal is good and as long as disagreeable secondary symptoms of morphinism are not observed. I am inclined to believe that the relatively unfavorable results of the goat protective-serum experiments can be traced back, for instance, to this point, since both of the goats used at the time the serum was taken were in a very bad condition clinically. . . .

"3. The protective action, which is attributed to the morphin immune serum in acute morphin poisoning is considerably greater than in analogous immunity tests with bacterial toxins. While the bacterial toxin in the animal requires a certain incubation period to be effective, the organism in the case of acute morphin poisoning, within a few minutes, is overtaken by the whole amount of poison introduced; and it is decided within a half-hour, as an average, whether or not the protective bodies, present or set up, will be able to withstand the onset of the morphin haptophore group. In the gradual process of bacterial intoxication, usually extending over hours and days, the reaction of the organism in regard to the struggle of the protective bodies against the toxin group is far less. For this reason the clinical use of the morphin immune serum is of value in chronic morphin poisoning or in the treatment of morphin withdrawal, but not in acute intoxication. If, therefore, the usefulness of the morphin immune serum against acute morphin poisoning proved to be very slight on further tests, still the field of chronic morphin poisoning or treatment of morphin withdrawal presents much more favorable opportunities for the use of morphin immune serum, since, in this case, the secretion of the poison in the body or the approach of the haptophore group of the poison toward the body cell, as the clinical symptoms show, takes place slowly, by degrees, and within the time period, obviously, always in small amounts.

"If we have felt that we had to confine, in this way, the action of the morphin immune serum to a theoretical basis, I should like to refer once again to the positive side of the matter by the following reflection which, in my opinion, admits of explanation only in the theory of the formation of protective bodies in chronic morphin intoxication. It has been shown with certainty by Faust, Marquis, etc., and finally by Totze in a very careful piece of work . . . that in acute morphin poisoning the greatest part of the morphin introduced in the body could be detected in the body organs or their secretions. On the other hand, in chronic morphin poisoning only a very small, insignificant part of the morphin is recovered in the body or its secretions, yet the amounts introduced are very much larger than in acute morphin poisoning. There must take place, accordingly, a destruction of the morphin in the body in chronic morphin intoxication, since a change of the morphin in the body cannot be substantiated at all or at most only in very small amounts. On the other hand, Antenruth has shown that in corpses the morphin in acute poisoning can be detected unchanged in large amounts, even after three years. In other words, the destruction of the morphin takes place only in living and not in dead animals. Therefore, we must assume that it is the living molecule of albumen which, in the sense of Ehrlich's immunity, causes the destruction of the morphin. Perhaps this supposition is still more plausible when we consider that morphin is traced back in its formation, undoubtedly, to the molecule of albumen, i.e., plants."

* * * * *

"In conclusion, I do not wish to omit reference to the fact that the morphin immune serum has already been used clinically in a series of human cases. Next to the experiments, which several other authors have made with the preparation made by the firm of J. D. Riedel under the name of "Eumorphol" and on which a report has not yet been made, besides the tests on insane already published, I myself have had an opportunity to treat a small number of pure morphinists and without exception, cured them by means of the morphin immune serum. A detailed clinical report of the first four cases observed by me has just appeared in the Zeitschrift fur Krankenpflege. As a resume of that, I may state that (1) Every case, without exception, was completely cured; (2) no harmful secondary reactions at all appeared on the use of the immune serum; (3) in all cases an alleviation of the discomfort of the patient as well as an easier course of withdrawal could be noted. The results of these clinical experiments may, therefore, be considered positive."

Mavrojannis—1902.[55]

"At the suggestion of Prof. Kalikounis we carried on a series of experiments on rabbits for the purpose of demonstrating that tolerance to morphin was due to production on the part of the organism of substances which exercise an antagonistic action toward that alkaloid. We tried to morphinize the animals in such a way that they could tolerate doses larger than the fatal dose; then we endeavored to find out if their serum had antitoxic properties.

"With the negative results obtained by different workers who had studied the question of tolerance to other alkaloids than morphin and especially those of Chavigny who had experimented with morphin, it was seen that in any case the antitoxic properties of the serum of morphinized animals would be quite weak. It was therefore necessary carefully to find out the minimal fatal dose of morphin hydrochlorate for the rabbits."

* * * * *

"We further observed that the aqueous extract of the brain of morphinized animals, introduced the day before through the alimentary tract was capable of protecting the animals against the absolutely fatal dose, when the brain extract of fresh animals had no effect on the same dose of the alkaloid.

"Thus our experiments show that the serum and the brain extract of morphinized animals possess weak, but real antitoxic properties toward morphin. These properties are transitory and not very lasting, as the animals which received the anti-morphin serum ten days previously could not resist the fatal dose."

J. Morgenroth—1903.[56]

"Contributions on the discovery of new antitoxic sera, the action of which is directed against poisons of known chemical composition, are accorded careful scrutiny by all who have worked in this field and have followed the work of late years. In most cases such experiments fail from the first because of the absence of a tolerance (*Gewöhnung*) to the poison and of the resulting impossibility of a systematic immunization. Further, the positive results so far obtained in this direction have not proved valid—Bashford has shown that a specific immunity against solanin, such as Pohl thought he had established, does not exist and Bashford and Besredka were just as unsuccessful in producing specific antibodies against Saponin. The work of Toulouse and d'Evelyn, who endeavored to produce an anti-alcohol serum through immunization, still remains a scientific curiosity, proof for which has not yet been established. Therefore, to describe accurately the present status of the question, it must be stated that an antitoxin has not yet been obtained by immunization, with poisons of known chemical composition. Ehrlich's side-chain theory is applicable here insofar as it recognizes, for the present, a fundamental and characteristic difference of the true toxins from the alkaloids, toxic glycosides, and toxic inorganic compounds and seeks to find an explanation for this difference in the peculiarity, thoroughly established by experiment, in the manner in which both classes of substances are distributed and attached. A sharp separation of the material into two groups, as Graham has done for the crystaloids and colloids, will in no way establish it and, as today these two classes of substances seem connected, we can also take into account the possibility that the sharp limits between the two classes can be one day wiped out. The theory that one or another alkaloid has possibly a group which can be attached by suitable receptors of the cell is, in itself, harmless.

---

[55] Mavrojannis—Etudes sur le mécanisme de l'accountumance à la morphine. Comp. Rend. Heb. des Séances et Mémoires de la Soc. de Biol. 1902, pp. 930-932.

[56] Morgenroth, J.—Zur Frage des Antimorphinserums. Berl. Klin. Wchnschr. 1903. Vol. 40. pp. 471-474.

"Morphin was most suitable for the immunization tests, on account of the known intoxication symptoms and it was fortunate that Hirschlaff recently made immunization against morphin the subject of a thorough study and thus sought to supplement the valuable work of Faust who would not consider the possibility of the formation of an antitoxin."

The author does not agree with Hirschlaff as to the dose *certe efficax* stating that 0.01 g. morph. hydroch. "far from kills every mouse" and upon experimentation decides that this dose should be 0.014 g. for a 15 g. mouse. Furthermore, in order to eliminate the possibility of any protective action residing in normal rabbit serum, when injected into mice in quantities equalling 1/30 to 1/10 of the body weight of the animal, he runs controls, treated with normal rabbit serum, and thinks that he observes a condition which Hirschlaff considers as a true effect of his antitoxic serum. He concludes, therefore, that the dose *certe efficax* should be at least 0.0165 in order to preclude any protective action from the rabbit serum.

He then proceeds to the tests of the serum of immunized animals on the mice, according to Hirschlaff's method and concludes as follows:

"We can sum up the results of our experiments by stating that, apparently, the positive result of Hirschlaff's experiments is only accidental, in raising the resistance by the injection of serum, which accounts for the fact that the doses used by him are generally not absolutely fatal. Whether in morphin tolerance it is a question of the formation of an antitoxin or only the destruction of the poison, possibly by oxidation as Faust maintains on the basis of his interesting experiments, has so far not been decided, and the decision must be reserved for further experiments which will not be long awaited."

In his undated monograph previously referred to[57] Hirschlaff discusses Morgenroth's criticism of his work as follows:

> "If I compare the results of my present experiments carried on in the chemical factory of J. D. Riedel, which covered approximately 150 rabbits and 400 mice and which I can here only briefly summarize, since a detailed publication containing the protocol will follow, with those of Morgenroth, I must, of course, admit that in my first figures chance did play a considerable role; but, on the other hand, I am inclined to point out that also Morgenroth's figures were influenced by chance, and this unfavorably. Further experiment on the animals has shown unequivocally that the true results of these observations are not so favorable as the first series seemed to indicate, but that, after all, they give positive results in spite of Morgenroth's negative figures. And further it is shown that Morgenroth's results are influenced by the facts; 1—that the number of rabbits sensitized as well as the number of control mice tested with the sensitized serum are too small, and, 2—that the doses of 0.012—0.018—0.024 g. morphin per 15 g. mouse used for the tests are too far apart to throw into bold relief all phases of the protective action of the serum to be tested."

M. Cloetta—1903.[58]

Cloetta does not accept the theory of antibody-formation similar to that in bacterial infections as the basis of the mechanism of tolerance nor does he agree with Faust that the destruction of morphin in the body offers the explanation. Working with rats and pigeons he endeavored to learn whether the capacity for increased destruction grew proportionately to tolerance. Although he found it possible to produce tolerance, he observed no increased power of destruction of morphin and therefore deduced that the "nature of the tolerance is not in intimate and causative relationship to the ability to destroy morphin."

Cloetta gives the following as possible bases upon which to explain the mechanism of tolerance:

1. Leukocytosis.
2. Decrease in ability of brain cells to combine.
3. Peculiar cell immunity in which the protoplasm under the effect

---

[57] Hirschlaff, L.—Uber das Morphin-Heilserum. (Eumorphol-Riedel.)

[58] Cloetta, M.—Uber das Verhalten des Morphins im Organismus und die Ursachen der Angewöhnung an dasselbe. Archiv. fur. exper. path. u. pharm. Dec. 17, 1903. 50 pp. 453-480.

of the poison no longer reacts with a functional disturbance in consequence of a tolerance for the stimulus.

The author studied each possibility by experimental investigation. After examining the first possibility, namely, leukocytosis, he found that in normal animals the injection of morphin caused a reduction of the leukocytes and this reduction was generally in proportion to the intensity of the poisoning—but in immunized animals there was no essential change in the behavior of the leukocytes. He further found that no destruction of the morphin occurred through the leukocytes and that, therefore, tolerance was not dependent on these conditions.

The author then takes up the second possibility as an explanation of the mechanism for tolerance, stating:

> "Is the tolerance due to the death of the receptors, that is, do the brain lipoids gradually lose the ability to combine the morphin and thus cause the influence of the poison to be diminished? I attempted to test this possibility by mixing the brain of an immunized animal with morphin and then centrifuging it out again with the addition of a solution of NaCl."

While the results of this experiment were positive in a certain sense, Cloetta accounts for this fact to his own satisfaction and turns to the last possibility as one offering the most promise. The following is his summing up:

> "From my observations it seemed to me a question of a gradual accustoming of the protoplasm to the influence of the poison in the case of chronic morphin poisoning. No protective action was indicated in the body of chronically poisoned animals. This tolerance of the cells, among which the cells of the brain occupy first place on account of their particularly strong ability to absorb morphin, seems to be quickly acquired, but is also quickly lost again, as happened in the case of the experiments on immunized pigeons and rats, when only an interval of two days (without the supply of the poison) was sufficient to make the brain cells again considerably more sensitive to the effect of the poison. Now, since the brain is normally able to combine morphin, it may also be assumed that, with this cell tolerance, the ability to combine increases sooner. The morphin has ceased to be a foreign constituent part of the brain lipoids. They take it up at an increased rate and this increased ability of the brain to combine with the morphin is also the reason for the increased destruction of the same. This is not a cause of immunity, but an accompanying phenomenon of the same, occasioned by the peculiar tolerance of the protoplasm. Therefore, this should not be spoken of as occurring through the death of the receptors, but rather through an increase and simultaneous decline of the susceptibility of cells for the toxophore group of morphin."

G. Argentina—1905.[59]

The object of this author's experiments was the verification of the results of Mavrojannis described above in order to compare the latter's method of immunization with that of Gioffredi. He morphinized two rabbits, one according to Gioffredi's method and one according to that of Mavrojannis, and then tested the protective action of the serum and of the brain extract of these rabbits each on a series of four normal rabbits. The rabbit immunized according to Gioffredi's method, weighing 1650 g., was started on a very small dose of morphin and increased gradually over a period of about two months until it was able to tolerate 80 cg. The rabbit immunized according to Mavrojannis's method, weighing 1220 g., received first a venesection and was started immediately on 30 cg. and rapidly increased until at the end of about a month it was able to tolerate 70 cg.

From the results of his experiments Argentina concludes:

> 1. "That Mavrojannis's method should not be preferred, because best results are obtained with the slow and gradual morphinization of the animals. The serum prepared from these animals is found to be much more active than that prepared from animals made tolerant to very high doses within a short time.
>
> 2. "That the brain extract of morphinized animals is capable of neutralizing the minimal fatal dose of morphin. However, it is always less active than the serum and it is also necessary to use a larger amount in order to derive the protective effects of the serum. But I had occasion to note that if the doses of the extract are greatly increased, fatal results will follow. This may not easily be explained. It can only be stated that this result is caused by the tissue of the nervous system."

D. Mirto—1905.[60]

A different approach to the subject of tolerance on the basis of antibody-formation as in the case of bacterial poisons is made by Mirto, who is rather doubtful as to the significance of the positive results of his investigations as to the sero-precipitation reaction in chronic morphin intoxication and the latter's value as a means of detecting morphin.

In a series of controls the author found that there were sufficient electrolytes in 1 cc. of a 1% solution of morphin hydrochloride to keep the globulins of 2 drops of normal rabbit serum in solution but insufficient to keep a larger quantity of globulin in solution. In regard to the serum of morphinized rabbits he found that no precipitate was formed until the rabbits were given from 25 to 35 cg. morphin hydrochloride per day. Beyond this daily dose, when 2 drops of the morphinized rabbit serum was added to a one per cent solution of morphin hydrochloride, the solution often becomes opalescent almost instantaneously.

---

[59] Argentina, G.—Contributo alla immunizzazione per morfina. Gazz. d. ospedali e. d. clin. Apr. 16, 1905. Vol. 26, pt. 1. p. 484-485.

[60] Mirto, D.—Sul significato della siero-reasione precipitante nell' assuefazione alla morfina e sul suo valore come mezzo di riconoscimento della morfina. Arch. farm. sper. Siena. Sept., 1905. V. 4, No. 9, pp. 406-418.

"After being from 20 to 30 minutes in the thermostat at 37 degrees, it became turbid. In a second phase, the formation of a finely granular precipitate was observed after 30-45 minutes at 37 degrees. After 45-60 minutes and at the most one hour and a half, it changed into a white flaky precipitate. Thus we observed the characteristic phases of sero-precipitation reactions. In general the reaction took place more rapidly and distinctly with the serum of rabbits which had received a greater amount of morphin hydrochloride. The normal rabbit serum, fresh and yellow-lemon colored, did not show, under the same conditions, any sign of turbidity or precipitation and remained clear for many hours in the stove at 37 degrees. It became turbid only after 12-24 hours.

"The above phenomena were observed in a one per cent solution of morphin hydrochloride in distilled water but did not occur in an analogous solution of morphin hydrochloride in 0.85% sodium chloride solution, even when larger quantities of morphinized rabbit serum were added."

* * * * *

"The sera of morphinized animals soon lost, after a day or so, their precipitating properities."

Repeating the experiment with codein and meconin he concluded that neither codein nor meconin became, under the same conditions as morphin hydrochloride, turbid or gave any signs of precipitation.

"All this, therefore, helped to show that, in chronic morphin poisoning, specific anti-bodies could be formed in the body which when coming in contact with the body generating them, (morphin hydrochloride) caused specific precipitation phenomena similar to what happens in the case of bacterial toxins. Therefore it was possible to conclude that the biological actions of the morphin and bacterial toxins were identical."

However, the author calls attention to an observation which he made by chance during his researches and which would give to his conclusions a different significance.

"In a robust normal rabbit which had been subjected to repeated and rather abundant bleedings, in the course of these experiments, we have noted, at a certain point, that even when one or two drops of its serum are added to one cubic centimeter of 1% morphin hydrochloride solution precipitation phenomena, as in the serum of morphinized rabbits, occur.

"The conclusion has been confirmed by experiments made on other rabbits. What explanation can we give for this new result? We said above that often there is no sharp distinction between a specific and a non-specific precipitation of protein, and that the difference is often due to the degree of concentration, temperature, and time at which precipitation occurs. Now in our case, while one cubic centimeter of a 1% morphin hydrochloride solution is sufficient to keep the globulins of two drops of normal rabbit serum in solution, it is not sufficient to keep in solution the globulins of the serum of rabbits subjected to repeated bleedings. This fact indicates that in the latter case the protein quotient of the serum, that is the ratio between the sero-globulin and the sero-albumin, has suffered a notable change.

"In other words, the globulins of the serum are increased, (in the same manner as has been observed by other authors in various other conditions such as fasting, etc.) in such a way that their precipitation occurs more rapidly. This can be considered identical to the precipitation which is observed by adding more than two drops of normal rabbit serum to one cubic centimeter of a 1% morphin hydrochloride solution.

"Now then, on the basis of these new facts what can we conclude from the preceding researches in which we observed the appearance of a sero-precipitation reaction, after a prolonged and increasing administration of morphin hydrochloride? What significance and what value can we attribute to the latter? We believe that the answer to this question is easy. In morphin habituation, an increase of globulins of the serum, occurs in the same manner as in other conditions, such as fasting, bleeding, etc. The sero-precipitation reaction which is observed is due entirely to this increase. This reaction has not, therefore, the meaning which was given above, i.e., the formation of a special antibody which, in the presence of the substance generating it, gives rise to precipitation phenomena; it is not specific since it will occur in conditions other than morphin habituation. Therefore, it cannot be used in the detection of morphin.

"If these researches lose much of their practical interest as a result of these conclusions, it seems to us that they open an unexplored path to the study of the physico-chemical relations which can be established between alkaloids, their salts, and the protein substances."

* * * * *

"The study of these problems is therefore of great interest and promises fruitful results, which, above all, may give a rational explanation of the selective action of the alkaloids for some special organs or tissues of our organism."

G. Marikovsky—1906.[61]

Because of the lack of agreement among investigators, Marikovsky undertook a series of experiments to study the protective action of the serum of morphinized rabbits and dogs on normal animals.

---

[61] Marikovsky, G.—Immunisierungs und sero-therapeutische Versuche dem Morphin gegenüber. Centralbl. f. Bakteriol., Parasitenk u. Infektionsk. 1906-7. Vol. 43. p. 494-507.

The author developed a new method by which he immunized a series of rabbits against morphin and which consisted in mixing with a fatal dose of morphin progressively decreasing amounts of potassium permanganate solution administered every three days. He also immunized a series of dogs using only the old method. From testing out the serum of these animals on guinea pigs, he concludes as follows:

> "(1) The absolutely fatal dose of morphin for the mouse is greater than that established by Morgenroth and Hirschlaff.
>
> "(2) Guinea-pigs lend themselves better than mice to the determination of the value of anti-morphin serum. Over 7 cg. morphin kills 100 g. guinea-pig.
>
> "(3) If rabbits are simply treated with continuously increasing doses of morphin, this procedure is much longer and doubtful in results. Much better results can be obtained, in a much shorter time, by my modified procedure.
>
> "(4) The life of the guinea-pigs poisoned with the absolutely fatal dose of the poison can be prolonged with the serum of the rabbits treated by the modified method, and they can be preserved even if the dose is not very much in excess of the absolutely fatal dose and the serum is administered immediately after the poison.
>
> "(5) Moreover, the life of the animals poisoned with the absolutely fatal dose can be prolonged with the serum of a dog immunized up to a certain point."

Marikovsky was so encouraged by these results that he immunized 102 rabbits whose serum he administered to 2 morphinized dogs, rapidly withdrawing the morphin and substituting the serum.

The author states that during the administration of the morphin the dogs were uncomfortable, timid, and of a neglected appearance. However, after a few days of treatment with serum the dogs became brighter, more responsive and their coats took on again their usual gloss. It was especially noted that the second dog took on weight very rapidly. Later both of these dogs were used for other experiments.

Because of these good results in the dogs, the author desired to study the effect of the serum on human beings, i.e., morphinists; however, it was practical at that time for him to secure only two suitable cases and in both of these the tests had to be discontinued on account of disagreeable secondary symptoms.

The author concludes as follows:

> "I do not maintain that I have accomplished very much, perhaps. But this much has been accomplished, that my investigations, perhaps in some measure, will contribute to shake the strong faith in Ehrlich's hypothesis—which moreover, is also attacked from other sides. . . ."

W. Rubsamen—1908.[62]

Referring to the work of Faust, Rubsamen questions whether the increasing ability to destroy morphin is the only cause of the increasing tolerance. He continues:

> "The phenomenon of chronic morphin intoxication in man shows us that, on the subcutaneous injection of the poison, therefore on very active resorption and rapid access of the morphin to the central nervous system, the morphinist reacts to a dose which would be very large,—fatal to an intolerant person. Therefore, in order to explain tolerance toward the amount of poison circulating in the first quarter of an hour by an increased ability to destroy it, we must assume that the removal of the poison takes place very rapidly. So far, we have no basis on which to work for a consideration of these relationships; this can be accomplished only by a series of experiments on small animals, in which it is possible to use the animals in toto at different times after injections and to determine the total amount of the poison present at the given periods. . . .. If we knew the speed with which morphin is destroyed in morphin tolerant animals, we could form an opinion as to how far into consideration as the basis for the chronic intoxication by morphin we could take, besides the increased ability to destroy the morphin, the susceptibility of the cells to the poison."

The author used white rats in his experiment, developing his own method for the determination of the amount of morphin present at a given time after injections. After determining that 60 mg. of pure morphin was absolutely fatal for an intolerant animal, he immunized a series of rats which were then killed and tested for morphin content.

The author then carried on a series of experiments to compare the conduct of the morphin in the organism of immunized animals with its behavior in intolerant animals. He concludes that immunized rats can destroy morphin more quickly than normal rats.

Rubsamen finally concludes that

> ". . . at the time when the strongest symptoms of poisoning would be expected to appear in an intolerant animal, there is still enough morphin in the whole organism of an immunized rat to poison normal animals. Chronic morphin intoxication therefore seems to have two causes: first, on continued administration, the ability to destroy morphin increases as Faust has shown in dogs and I have corroborated in rats. Thereby the poison dose is partly diminished within the first hour, which could be effective for tolerant animals. But, in the first hour after injection, there still circulates such a great amount of poison without symptoms of poisoning that as a second cause of the insensibility of tolerant animals, we must accept a cellular immunity. On what this depends we cannot at present state."

---

[62] Rubsamen, W.—Experimentelle Untersuchungen über die Gewöhnung an Morphin. Arch. f. exper. Path. u. Pharmakol. 1908. Vol. 59. pp. 227-244.

C. Ferrai—1909.[63]

In connection with an investigation[64] as to the production of antibodies in chronic morphin intoxication, Ferrai observed a phenomenon which he considered significant and from which he concluded that under certain conditions, unlike the salts of other alkaloids (strychnin, cocain, codein) morphin salts exerted an anticomplementary action.

In a test involving complement fixation Ferrai noted that, while there was no hemolysis in the tubes in which the serum of a morphinized rabbit came in contact with a solution of morphin hydrochloride in the presence of fresh complement and later sensitized sheep's cells, the same phenomenon took place, although to a less degree, in the control tubes containing normal rabbit serum and in those containing normal dog serum. On the other hand, there was complete hemolysis in the other control tubes containing the immune rabbit serum but no morphin and incomplete hemolysis in the tubes containing morphin but no rabbit serum. By varying the concentration of the morphin solution and the volume of the immune serum, Ferrai determined that the intensity of the phenomenon, at least within certain limits, was proportionate to the concentration of the morphin solution and the volume of the serum.

From his experiments, Ferrai concludes:

"1. Under special experimental conditions, morphin salts prevent the production of hemolysis in the hemolytic system,—guinea pig complement plus amboceptor from a rabbit immunized to sheep's blood plus sheep's cells.

"2. The nature of the phenomenon is anticomplementary; morphin has no action on the hemolytic amboceptor.

"3. The inactivation of the complement by the morphin takes place also at zero degrees.

"4. This anticomplementary activity common to the various morphin salts (hydrochloride sulphate, acetate) is not possessed by the salts of other alkaloids (strychnin, cocain, codein)."

M. Albanese—1910.[65]

Agreeing with Faust that in morphinism the morphin is completely transformed in the body, Albanese proceeded to investigate the seat of the transformation. The organ he selected for examination was the liver. He reports as follows:

---

[63] Ferrai, C.—Sul Potere Anticomplementare Della Morfina. Pathologica. September 1909. Vol. I. pp. 505-511.

[64] We have been unable to locate a report of the original investigation.

[65] Albanese, M.—Sur la Transformation de la Morphine dans l'Organisme des Animaux habitués au poison. Arch. ital. de Biol. 1910. Vol. 53, pp. 439-444.

"After killing a dog, which through daily increasing injections of morphin hydrochloride had become able to stand, without apparent effect, doses of more than one gram a day, the liver was removed. The liver was chopped up and reduced to a pulp and to it was added about one-half its volume of a physiologic sodium chloride solution and a few crystals of thymol (or better, if possible, a little silver fluoride), then there was added to this mixture 0.20 g. of morphin hydrochloride (to 100 g. of liver), and it was placed in an incubator at 38 degrees and stirred frequently. After seven or eight hours, by treating the mixture by a proper method of extraction, it was easy to recover from 0.16 g. to 0.17 g. of pure crystalized morphin, corresponding to almost the whole of the morphin given, except for the small unavoidable losses.

"It might, therefore, at first appear that the liver in tolerant animals, which is entirely unable to change even small doses of morphin mixed with it, in vitro, has nothing to do in vivo, either, with the destruction or transformation undergone by the morphin in the body. But if one stops a moment to think about the fact of which I have already spoken that the liver of morphinized dogs had even less effect on added morphin than that of normal animals, and if one believes the observations of Faust, that that amount of morphin which the bodies of tolerant individuals is capable of changing is not unlimited but proportionate to the maximal dose to which the animal has become tolerant (so that when a dose of morphin which noticeably exceeds the preceding dose is given to a tolerant dog, the surplus not only causes characteristic toxic symptoms but appears unchanged in products of elimination), the apparent contradiction which seems to exist from the recorded facts is very well explained and brings us to a new line of thought. One is, in fact, obliged to say that, even admitting that the liver is really able to acquire the ability to alter injected morphin (or at least to assist in its alteration) *during the period of morphinization,*—as long as the injections are continued,—this ability will be entirely used up,—saturated as it were,—in transforming the morphin circulating in the blood; so that there will not remain any of this ability available for the extra quantities which are artificially added in vitro. Thus it is easily explained how this organ during the period of the injections is not even able to alter small quantities of the poison which normally the liver does alter. From this arose the idea of investigating how the liver would behave, not during the period of morphinization, but rather *after the stoppage of the injections, during the period of abstinence,* that is to say when it would be supposed that the ability acquired through habituation, still persisting, was not used up or masked by the daily quantities of the poison administered.

"As a matter of fact, the result of the experiment at this time confirms the a priori reasoning.

"If, instead of using the pulp of a liver from a morphin tolerant dog killed while he still was receiving the poison daily, the liver of a dog was secured during the abstinence period, that is to say, from 48 to 60 hours after the last dose of from 1 to 1½ g. of morphin hydrochloride had been given, and if after adding to it as before 0.20 g. of morphin hydrochloride (for 100 g. of liver), the mixture is treated for the extraction of morphin, there is crystallized out but a very small quantity of the alkaloid, rarely exceeding 0.02 g. to 0.03 g.

"Hence, it is indisputably shown, according to what I have just pointed out, that, in the transformation which morphin undergoes in the organism of tolerant animals, the liver plays an important rôle.

"Naturally it would not be proper to conclude that this organ is the *exclusive* seat of the phenomenon; and it is necessary carefully to compare the activity of the liver with that of other organs and tissues."

G. E. Pettey—1910.[66]

From clinical observations, Pettey concludes, as an explanation of the mechanism of the withdrawal phenomena, that all of the dangerous and most of the painful symptoms incident to withdrawal are due to retained excrementitious matter and the extremely toxic condition resulting therefrom. He states that if the system could be freed from this material the opiate could be withdrawn without shock, collapse, heart failure, diarrhoea, or other dangerous symptoms and that the suffering would subside in a few days' time and could be controlled by some member of the belladonna group.

G. C. Berri and C. R. Belgrano—1911.[67]

These authors carried on four series of tests on rabbits to determine the ability of cocain and morphin to produce aggressins. After determining the minimal lethal dose, the peritoneal exudate was obtained from a rabbit which had been treated with morphin hydrochloride and injected in a series of rabbits, which were later treated with less than the minimal lethal dose. These rabbits plainly showed toxic symptoms and died. The second series of rabbits were given five injections of the exudate and then a dose of morphin slightly greater than the M. L. D. These rabbits survived. In the third series the rabbits were treated first with the serum of immunized rabbits and then with a dose of morphin slightly above the M. L. D. Two of three rabbits thus treated lived for five and seven days respectively, while the control rabbit died within fifteen hours. The fourth series were treated with immune serum, aggressin and slightly less than the M. L. D. These rabbits survived.

---

[66] Pettey, G. E.—A rational Basis for the Treatment of Narcotic Addiction. New York Med. Jour. Nov. 5, 1910. V. 92. pp. 915-917.

[67] Berri, G. C. and C. R. Belgrano—Aggressine Rispetto Alla Cocaina Ed Alla Morfina. Annali Dell 'Instituto Maragliano. 1911. V. 5. pp. 42-49.

From these experiments the authors concluded:

> "These data therefore lead us to the conclusion that the blood serum of a rabbit treated with aggressin of morphin possesses immunizing properties and we believe that we are in a position to state that it possesses antiaggressenic properties on the rabbit proper."

D. Morat—1911.[68]

Morat, in addition to reviewing Sollier's explanation of the mechanism of withdrawal, in connection with a discussion of the experiments which he carried on to discover the influence of toxic solutions on the red cells and leukocytes before and during detoxication, gives the following on tolerance:

> "Two hypotheses may be proposed according to whether one admits that the phenomenon of tolerance to the toxin is analogous to the phenomenon of microbic immunity and that it is the result, as Gioffredi believes, of the secretion of an anti-morphin, neutralizing the morphin, or whether one considers it as being due to the progressive and selective adaptation of the cells of the organism to the toxic product contained in the fluids.
>
> "In the first instance, one might claim that just as an antitoxin injected into the body increases the hematopoietic and chemotactic reactions, so does the antitoxin of the organism, opposed to morphin and finding itself no longer antagonized during the course of detoxication by the daily equivalent supply of poison, cause in this organism an excessive reaction which is evidenced by the hyperleukocytosis with polynucleosis and by the various hematologic changes which we have described during the period of suppression.
>
> "However, the existence of an antitoxin in the body of the morphinist, even though it has not been definitely disproved, does not seem likely, in view of certain experiments and particularly so from the fact that the serum of morphinists has not, according to Ehrlich, any antitoxic property against morphin. It appears, therefore, at this time, that the tolerance against morphin is alone the result of an adaptation of the protoplasm to new surroundings; the cells possess themselves of the toxic substance and incorporate it, modified or not, into their protoplasm. After that, every alteration in the toxic equilibrium of the body fluids causes in the cells of the body structural changes which express themselves by the occurrence in the blood of cellular debris and albuminoid products of protoplasmic disintegration.
>
> "Besides this the experiments of Buchner have shown that certain principles resulting from the destruction of tissues and from the transformation of albumens, possess the same chemotactic properties as do bacterial toxins. We would attribute, therefore, to the products resulting from the transformation of tissues under the influence of the disturbed toxic equilibrium of the body fluids, a chemotactic rôle and the stimulation of the hematopoietic organs, evidenced

---

[68] Morat, D.—Le Sang et les Sécrétions au cours de la morphinomanie et de la Désintoxication. Thèse de Paris. 1911.

during the first period of detoxication by the increase in red cells with an increased resistance and by the hyperleukocytosis with polynucleosis.

"The mononucleosis of the second period which is a real mononucleosis is the direct and logical continuation of the fundamental reaction just as occurs in the greater proportion of acute infectious diseases. In morphin detoxication, the cause which produces the blood reaction, that is to say the process of cellular transformation, is always considerable and lasts for a certain definite period; this is why, following the fundamental reaction which stimulates the hematopoietic functions, there is always a reaction of the lymphoid organs evidenced by the mononucleosis. Slower to appear but lasting longer, this mononucleosis completes the work of the previous polynucleosis having for its function at the same time that of phagocytosis of the products of cellular disintegration and that of absorption of degenerated polynuclears."

A. A. J. van Egmond—1911.[69]

Referring to certain observations which he made on tolerant dogs in regard to the pulse frequency, van Egmond states:

"These observations are not without significance in regard to the theory of chronic morphin intoxication. Faust concluded on the basis of his studies on the recovery of morphin in tolerant and intolerant dogs that the body had the ability to destroy increasingly large amounts of the poison and that therefore the nervous system was protected against active doses of morphin. Another group (Cloetta, Rubsamen) maintain that in addition to the increased morphin destruction there must be an immunity of the cell to the poison. The above experiments show the latter to be true. For in tolerant animals the behavior of the vagal centre shows that a few hours after poisoning with even small doses of morphin there is enough morphin in the body to cause the individual centres to react. On the other hand there is no reaction on the part of the cerebral cortex and vomiting centre, even if the dose is a hundred times greater. The vagal centre is therefore the indicator for the presence of the active dose of morphin in the body at a time when other parts no longer react. It is of especial interest to note that two centres situated so closely together in the medulla oblongata behave so differently in chronic intoxication."

H. Langer—1912.[70]

On the basis of a series of experiments in which he studies the question of whether or not heroin is capable of producing chronic intoxication, Langer concludes that tolerance cannot be explained alone by the ability of the body to destroy the drug but must depend on the cellular dulling against the active poison. He bases his conclusion on his observation that while in chronic intoxication heroin is destroyed in gradually increasing amounts in the body, only partial tolerance to the narcotic property of the heroin and no tolerance at all to the stimulating property may be established.

---

[69] van Egmond, A. A. J.—Ueber die Wirkung des Morphins auf das Herz (zugleich ein Beitrag zur Frage der Morphingewöhnung). Arch. f. exp. Path. u. Pharm. 1911. Vol. 65. pp. 197-213.

[70] Langer, H.—Ueber Heroinauscheidung und -gewöhnung. Biochem. Zeitschr. 1912. Vol. 45. pp. 221-238.

H. Dorlencourt—1913.[71]

This author repeated the experiments earlier performed by Albanese on an intolerant animal and on animals showing varying degrees of tolerance. These experiments led the author to conclude that Albanese's work was corroborated and that the liver has the ability to destroy morphin, which ability increases at the same rate as that at which tolerance is established and is in proportion to it.

A. Valenti—1914.[72]

Valenti reports some experimental investigations dealing with certain phenomena observed through the use of the serum of morphinized dogs withdrawn from the drug. His preliminary review of the literature and his objects are set forth as follows:

> "From an experimental standpoint as yet very few clarifying chapters on the investigation of chronic morphinism which pretend to furnish an explanation for the appearance of the severe disturbances which occur during the withdrawal period in individuals who are accustomed to the influence of this alkaloid, are beyond dispute, for the collected experimental data and hypotheses which have been advanced, concerning this much contended subject of chronic intoxication, are not sufficient to explain to us why, from time to time, symptoms of withdrawal appear.
>
> "The fact that the system accustoms itself to destroying increasing quantities of morphin (Faust) relative to the increase of the accustomed ferment reaction of disintegration which regularly takes place in the tissues (Schmiedeberg) does not explain the condition. Equally unsatisfactory is Rubsamen's opinion that the cells become less and less sensitive toward the poison to account for the severe symptoms during the withdrawal period.
>
> "On the other hand there are also the experiments undertaken for the purpose of determining whether the acquired immunity toward this alkaloid or others

---

[71] Dorlencourt, H.—Étude sur la Déstruction "in Vitro" du Chlorhydrate de Morphine, par les Organes d'Animaux accoutumés et non accoutumés. Séances et Mémoires de la Soc. de biol. 1913. Vol. 74. pp. 895-897.

[72] Valenti, A.—Experimentelle Untersuchungen ueber den chronischen Morphinismus; Kreislaufstorungen hervorgerufen durch das Serum morphinistischer Tiere in der Abstinenzperiode. Arch. f. exper. Path. u. Pharmakol. 1914. Vol. 75. pp. 437-462.

might be analogous to that of bacterial toxins. In this case we might attribute the toxic phenomena which are produced by the absence of the neutralized poison, to the hypothetic antimorphin theory of Gioffredi. Yet all these experiments lack sufficient demonstration.

"Indeed morphin, differing from other alkaloids, shows an anticomplementary power (Ferrai) in consequence of which, the salts of morphin retard the appearance of hemolysis in the hemolytic system—guinea-pig complement and the amboceptor of rabbits immunized to sheep's blood cells. In spite of all this, the experiments of Morgenroth, Cloetta, Mirto, and Ferrai show corresponding negative results in an attempt to establish the existence of antibodies in chronic morphin poisoning. They discredit therewith the scanty positive results in the immunizing of mice which Hirschlaff obtained by injecting them with the serum of rabbits which were accustomed to morphin.

"Marmé has advanced the theory that the symptoms of morphin withdrawal may be attributed to a product of oxidation of the alkaloid (dehydromorphin or oxidimorphin). This he showed in the liver and lungs of dogs which were treated with increasing doses of the poison. But other authors like Donath and Stark could find under the same trial conditions no trace of oxidimorphin in the blood and urine of animals treated with morphin. Moreover, it remains certain that this product of morphin oxidation, which is readily obtained either through the action of a vegetable oxydase on the alkaloid (Bougault) or through the influence of atmospheric oxygen on an alkaline substance separated from the morphin (Tolstorff), is very slightly toxic. According to some authors, it is absolutely inactive, while it is very readily removed and separated.

"The experiments of Albanese also show that the liver of morphinized dogs during treatment with morphin is of course not in a position to exercise, in vitro, any influence on the poison, that qualifies them during the period of withdrawal to destroy or change increasing quantities of it. These experiments may possibly supply us with suggestions relating to the question of tolerance but they tell us nothing about the incontestable appearance of the severe disturbances, which are evidenced on discontinuing the supply of the poison.

"In view of such scanty experimental data, a further study of this interesting problem seems indicated.

"I began therewith to determine whether the serum of morphinized dogs, from which the poison had been withdrawn, could cause disturbances of the circulation, when injected into the veins of normal dogs. Such disturbances appeared uniformly but in a more severe form in the toxic picture of morphin withdrawal."

His procedure consisted briefly in introducing into the left carotid of a normal dog serum obtained from the blood of a dog which had been treated with morphin by daily hypodermic injections until a high degree of tolerance had been established. Certain circulatory disturbances followed the injection of this serum and were recorded as shown in his tables and graphs. A considerable number of experiments were carried on, in which dogs accustomed to different amounts of the drug were employed and in which the serum used was obtained after vary-

TABLE VIII *

Time	Highest and lowest frequency of pulse in a half min.	Highest and lowest blood pressure in mercury millimeters	Observations
4.34	110–114	124–130	Normal
4.40	106–108	126–134	Normal
4.45	112–114	128–134	Normal
4.46			The injections were begun
4.54	120–120	134–144	After 8 cc.
5.02	72– 78	132–156	After 16 cc.
5.11	72– 72	130–156	After 24–½ cc.
5.17	78–108	120–150	After 30 cc.
5.18			The injections were discontinued
5.20	84–102	112–146	
5.25	90–114	116–138	
5.34	72– 84	112–148	
5.39			The injections were continued
5.40	84–120	126–138	After 35 cc.
5.48	102–126	112–130	After 43 cc.
5.52	126–132	106–110	After 47 cc.
6.00	66– 72	120–152	After 54 cc.
6.04	78– 84	125–152	The injections were stopped
6.10	108–120	118–134	
6.15	72– 78	130–144	

TABLE IX *

		Before the injections	After the injections
		mm.	*mm.*
Blood pressure in mercury millimeters	Highest	134	156
	Lowest	124	106
		10	50
		no.	*no.*
Frequency of pulse in half a minute	Highest	114	132
	Lowest	106	66
		8	66

---

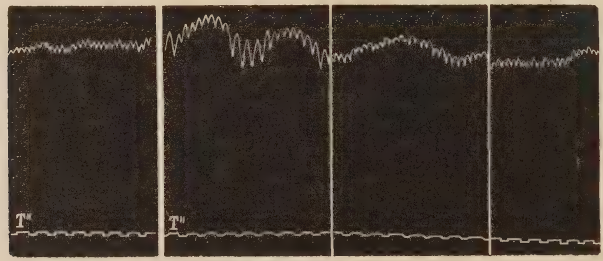
* From—Valenti, A.—Experimentelle Untersuchungen ueber den chronischen Morphinismus; Kreislaufstorungen hervorgerufen durch das Serum morphinistischer Tiere in der Abstinenzperiode. Arch. f. exper. Path. u. Pharmakol. 1914. Vol. 75. pp. 437-462.

ing periods of withdrawal. The possibility of causing circulatory disturbances with the serum of a normal dog was considered and eliminated through control experiments.

In order to give the reader a concrete idea of Valenti's technique and his methods of recording, the following experiment has been selected as typical:

> "In a healthy dog of 6 kilograms, the neck was opened, the carotid laid bare and the injections made into the right external jugular. Into this animal was injected the serum of a dog of 9,100 kilograms, which, beginning with 0.05 grams as a daily dose until, during a period of three months, 2.25 grams per day was reached, had been injected subcutaneously with a total of 55.12 grams of morphin chloride. After a three days' withdrawal of the morphin, a venesection was made of the femoral vein and 150 cc. of blood was collected, which, when centrifuged, furnished 60 cc. of a lemon-colored serum.
>
> "In this . . . experiment the table shows, still more clearly, the great variations between the minimal and maximal blood pressure and pulse rates and still more striking is the difference in the character of the pulse which would appear in one and the same unit of time, as the charts which I take from the record show."

Plate II[73]



Normal. 5:17 o'clock, after 30 cc serum

From these experiments, Valenti closes his report with the following:

> "Certainly these observations seem to be worthy of publication, even though for the time being they cannot be interpreted with certainty, because during the foregoing experiments I was also able to observe certain details which required further research.
>
> "The only thing that can be accepted as unqualifiedly true is that the severe disturbances during morphin withdrawal, at least those affecting the circulation,

---

[73] From—Valenti, A.—Experimentelle Untersuchungen ueber den chronischen Morphinismus; Kreislaufstorungen hervorgerufen durch das Serum morphinistischer Tiere in der Abstinenzperiode. Arch. f. exper. Path. u. Pharmakol. 1914. Vol 75. pp. 437-462.

cannot alone be due to the absence of the stimulus which morphin exercises on the organs—a stimulus to which the organs and especially the elements of the central nervous system, have become so accustomed that the absence of the poison is in a position to cause a *defect in the daily functioning of the organs (Cloetta).* Also the serum taken from morphinized dogs during the withdrawal period can bring about the very same disturbances of the circulation when it is injected into normal animals not accustomed to the stimulus of the morphin.

"Every other conclusion or hypothesis would be premature under the present conditions of the experiment. Therefore, I am limiting myself to grouping briefly the observed facts, the main points of which are as follows:

"During the injections of the serum from normal dogs into the veins of animals of the same species, no kind of noticeable circulatory disturbances is brought about. On the other hand, the serum from morphinized dogs in withdrawal causes constant disturbances of the circulation, which are characterized by a clear pulse arrhythmia with a tendency to an acceleration of the pulse and a lowering of the blood pressure. These fluctuations are in direct proportion to the doses of morphin to which the animal was accustomed and appear just as clearly when the serum from a morphinized dog, which has been withdrawn from the drug for some time, is injected.

"Similar disturbances of the circulation, as were observed as a result of the action of the serum, are seen in morphinized dogs during the withdrawal period. As a matter of fact, there can also be demonstrated in these a noticeable rising of the pulse beat, profound arrhythmia and arterial hypotension. All these appearances pass away in rapid succession, if the animal is again given morphin; again, a distinct morphin pulse is indicated as soon as the daily dose of the alkaloid, to which the animal was previously accustomed, is exceeded, entirely independent of the total amount given during the experiment.

"It is evident to every one without further continuing that, with the establishment of such facts, new problems arise. I am engaged in a study of them and hope that out of it will be drawn valuable conclusions."

In 1923 Valenti[74] supplemented these investigations by a study of the action of the blood of morphinized dogs during morphinization and withdrawal on the blood vessels. For this purpose he used Bissemski's technique—the auricular circulation of the rabbit—injecting small amounts of the blood of dogs before morphinization, after morphinization when they had reached a dosage of 1.5 g., after about three months' administration, and during withdrawal, and determining graphically in each case the vasoconstrictive strength.

Valenti gives the following conclusions:

"1. The blood serum of morphinized dogs during morphin abstinence obtained by immediate centrifugation of the blood extracted from three to four days after the last injection contains a large quantity of vasoconstrictors which are capable of causing a very intense and prolonged vasoconstriction of the blood vessels.

---

[74] Valenti, A.—Sulle cause dei disturbi dell'astinenza morfinica nei morfinisti, Gazz. Internaz. Medico-Chirur., 1923, Vol. 28. pp. 217-218.

"2. These vasoconstrictors are not found in the blood serum during the period of morphinization; if present at all, they are only found in the same small quantities met even in normal serum, and only produce a mild transitory vasoconstriction of the blood vessels.

"3. The quantity of these substances seems to be in direct relation to the quantity of morphin to which the animal was habituated, for the vasoconstrictive action is much more marked and prolonged as the dose of the alkaloid administered to the animal is increased.

"However, the presence of this large quantity of vasoconstrictors in the blood serum of morphinized animals during the period of abstinence does not only strengthen my original researches, but may also throw some light concerning the genesis of many disturbances during abstinence.

"With the total of these researches the obscure problem of the genesis of the grave symptoms arising during morphin abstinence seems to become clearer, and may sooner or later lead to satisfactory results from the point of view of rational therapy. The latter may be of great use at the present hour when the custom of the use of these drugs is assuming an aspect of a serious social problem."

K. van Dongen—1915.[75]

van Dongen accepts the conclusions of van Egmond in support of the theory that the ability of the organism to destroy increasingly large amounts of the drug is not the sole basis of the mechanism of chronic opium intoxication, but in addiction the cells of the body become progressively less sensitive to the action of the drug. This author proceeds to investigate in dogs and rabbits the reactions of the respiratory center and of the pupil which had not yet been studied in this connection.

van Dongen sums up as follows:

"If we compare the rapidity with which the different centers become tolerant to a given dose of morphin, for example 10 mg. per kilo, the following is true: This dose was given to 'Fox' (dog number 2) from January 14 to February 13 (first to thirtieth day); the pupil became tolerant as early as February 1; on February 5, vomiting ceased; on February 9, evacuation of feces ceased; on February 13, neither narcosis nor slowing of the respiration was observed. The same procedure was observed when from February 13 to March 1, 20 mg. per kilo was administered. On February 19, the pupil was tolerant; on February 21, the vomiting center; on February 25, the evacuation of the feces ceased, and on February 27 there was observed no narcosis or respiratory reaction. In the dog 'Jim' (dog number 1) tolerance followed in the same course and with the same rapidity.

---

[75] van Dongen, K.—Beiträge zur Frage der Morphingewöhnung. Arch. f. Physiologie. 1915. Vol. 162. pp. 54-66.

"The experiments show . . . that the narcotic action ceased when there was still a respiratory reaction. But the difference in time in the tolerance of both functions is not great in 'Jim' and does not exist at all in 'Fox.'

"The following represents the order in which these symptoms take place, beginning with the center which becomes tolerant most quickly and ending with that which usually does not become tolerant: pupil—vomiting—evacuation of feces—narcosis—respiratory center—emptying of stomach—vagal center.

"It can be seen that the centers which lie so closely together in the medulla oblongata as the vomiting center, respiratory center and vagal center behave very differently in morphin tolerance.

"The rapidity with which the different functions become tolerant to morphin is not parallel to the sensitiveness with which these functions react to the different morphin doses in intolerant animals.

"In the following table are given the smallest doses per kilo which produce in intolerant dogs the various symptoms, according to the experiments of van Egmond and myself:

"Vagal center	0.04	mg.	per	kilo.
Nausea	0.04	"	"	"
Vomiting	0.1	"	"	"
Evacuation of feces	0.1	"	"	"
Narcosis	0.1	"	"	"
Respiratory center	0.1	"	"	"
Emptying of stomach	0.5-1.6	"	"	"
Pupil	1.0		"	"

"It can readily be seen that nausea which disappears rather quickly in tolerance and the vagal reaction for which tolerance is not possible appear in intolerance in animals on the same very small doses, while the stomach action for which tolerance is possible to only a slight degree and the effect on the pupil which disappears most quickly in tolerance appear upon a dose 25 times greater.

"All of these observations support the conclusions drawn by van Egmond that as an explanation for morphin tolerance the increasing ability of the organism to destroy morphin advanced by Faust is not sufficient but that there must be a specific cell immunity which is developed by the different centers and organs with varying rapidity and which in general cannot be developed by the vagal center."

From his investigations on rabbits van Dongen concluded that these animals cannot be made tolerant to morphin. He studied the effect on the respiratory center according to the same procedure used in the case of the dogs.

van Dongen gives the following as his final conclusions:

"1. In dogs the respiratory center becomes tolerant to morphin. There takes place a complete tolerance even to 1,800 times the originally active minimal dose.

"2. The central apparatus of the pupil in dogs may become completely tolerant to large doses of morphin.

"3. The order in which in morphin tolerance in dogs the different centers no longer react to the morphin is pupil—vomiting—evacuation of feces—narcosis—respiratory center.

"The sphincter muscles of the stomach become tolerant only slowly and incompletely and in general the vagal center does not become tolerant.

"4. In addition to an increased destruction of the morphin there must also be accepted a 'cell immunity' in explanation of morphin tolerance, which the different centers and organs develop with varying rapidity and which is absent in the vagal center.

"5. The rapidity with which the different centers and organs become tolerant to morphin is not parallel to the rapidity with which normal dogs react to morphin.

"6. Rabbits do not become tolerant to morphin as the experiments on narcosis and respiration show."

J. Biberfeld—1916.[76]

In a study of the specificity of morphinism, Biberfeld investigated the reaction of the cerebrum of morphinized dogs to scopolamin, heroin, and veronal.

The author found that in each of the three series two dogs which had been morphinized for about four to six weeks reacted normally to the dose of scopolamin, heroin or veronal. He concludes:

> "The determination of the effectiveness of narcotic-substances, including not only alkaloids but also one of the fatty series, in dogs which have been addicted to large doses of morphin, shows that the addiction of the cerebrum of the animal is positively specific. It maintains its sensitiveness even towards the derivatives of morphin."

Biberfeld also undertook to determine the effect of lipoid feeding on the establishment of tolerance. He found that the feeding of cholesterin did not influence the tolerance curve.

On the basis of the following statement this author also studied the immunizing effect of the previous injection of serum taken from morphinized dogs in normal rabbits and cats on the administration of morphin:

> "As is known, now and again reports appear in the literature of experiments demonstrating the existence of some kind of 'Immune substances' in the blood of animals which are addicted to alkaloids. . . . So far there has been no corroboration of these assertions. Still it is possible according to the above observations that the resistance to the morphin is carried over by the blood of the immunized animal to the others."

---

[76] Biberfeld. J.—Zur Kenntnis der Morphingewöhnung. II. Mittleilung. Über die Spezificität der Morphingewöhnung. Biochem. Ztschr. 1916. Vol. 77. pp. 283-297.

Finally Biberfeld tried to find out how long the tolerance remained after the cessation of injections. He found that if a short period was allowed to elapse (2 to 3 days) there was no variation in tolerance, but after a longer period—10 days—part of the tolerance had been lost.

In brief the author concluded that:

> "1. The addiction to morphin observed in dogs upon continuous injections is specific; it does not even apply to diacetyl-morphin.
>
> "2. The feeding of lipoids (cholesterin) does not affect the course of addiction
>
> "3. Immunizing transferable substances are not constantly indicated in the blood of addicted animals.
>
> "4. After about ten days elapse the cerebrum of addicted animals again reacts toward morphin; still there remains a sort of latent state of addiction—abstinence symptoms were not observed."

M. Grüter—1916.[76a]

Grüter first reviews different theories relating to the fate of morphin in the body, covering the work of Orfila, Tauber, Kaufmann-Asser, Faust, Cloetta, and Frankel. He then at considerable length describes the teratogenetic effects of certain drugs when injected into chick embryos, covering the work of Féré, Gaspard and Réaumur, Jan Tur and others. In these pieces of work he sees a definite relationship between the toxicity of various substances on the embryos and on the adult individuals. He points out that while Féré in his work sought to determine to what extent certain poisons produce deformities, he sought on the other hand to test the influence of the development of the embryo on the destruction of the injected alkaloids. He continues as follows:

> . . . "Our experiments differ also as regards their extent in time. Féré contented himself with an observation period of 72-96 hours; I incubated the eggs much longer in order that larger and more differentiated quantities of cells might exert their effect on the alkaloids. In view of the entire arrangement of the experiments, this seemed the only possible way of obtaining exact quantitative particulars regarding the amount of the destruction and the conditions leading to it. In order to accomplish this successfully, we must first try to orient ourselves regarding the chemical processes which go on in the egg in the course of incubation.

[76a] Grüter, M.—Ueber die Zerstörung von Morphin und Morphinderivaten bei der Entwicklung von Hühnerembryonen. Arch. f. exper. Path. u. Pharmak. 1916. Vol. 79. pp. 337-360.

Grüter then proceeds to a discussion of the chemistry of fertilization and development of the animal egg, quoting the works of Loeb, Warburg, Bohr and Hasselbach, and Escher, because, as he states:

> . . . "the foundation of my investigation rests on these established facts. We have seen that the embryos are disturbed in their development by poisons in the same way as adult organisms. Numerous investigations have established that both oxidative and fermentative chemical processes go on in the incubated egg, and in the same proportions as in the adult individual. After all that, I considered myself justified in attempting to solve the question concerning the mode of the destruction of morphin and its derivatives in the animal organism by injecting those substances into eggs and exposing the latter to incubation under varying conditions."

After describing in detail his method of injecting solutions of morphin, heroin and codein, he describes his findings in detail in experiments with artificially incubated eggs, and his method of analysis for the recovery of the injected drug. He carries these experiments through under different conditions—with a normal supply of oxygen, with a reduced supply of oxygen and with an increased supply of oxygen. The discussion of his findings, together with his summary, is contained in the following:

> "It is evident from all these experiments that there is no essential difference as regards the destruction of alkaloids between incubation with increased supply of oxygen and incubation under usual conditions. The active principle does not seem to be the available oxygen in itself; also, the previously formed ferments exert no destructive influence under the greater supply of O_2. The determinative element is the development of the protoplasm, and manifestly a certain organization of the albumen does not suffice; there has to be a tolerably advanced differentiation in the cell formation and tissue-building in order that destruction of the alkaloids may set in. If this condition is fulfilled, then even the usual supply of oxygen in the atmospheric air may completely suffice for the destruction; *at all events, the latter seems to be more complete when the embryo is completely developed and the supply of oxygen is more abundant,* as a comparison of Experiments 2, 3 and 4 with Experiments 39 and 40 shows. Since, on the one hand, we may regard the injections into the incubated egg made in the manner described equivalent to chronic intoxication with morphin, etc., and on the other hand, the chemical influences appear to be the same as in adult animals, the results obtained permit us to draw certain conclusions as to the cause of the destruction of morphin in morphinism. It is, as we have seen, not just any organized protoplasm that receives it, but probably a completely developed cell-system which attains its development only at the end of the embryonic development. This may be evidence of the fact that the destruction takes place through a capacity of the nervous system which has been acquired under the influence of habituation. If, as a result of the chronic presence of

morphin, ferments were formed, which had as their task the destruction of the same, one would expect that such processes would appear even in the earlier stages of incubation. But that is certainly not the case. The problem of the destruction of morphin seems, consequently, to possess a decidedly morphological basis, in which an oxidation evidently plays the chief rôle. In connection with the clinical results of morphin abstinence this circumstance is evidence for the fact that the cause of morphin destruction in morphinism is to be attributed to an acquired cell function of the central nervous system. And herewith I agree with Cloetta's conception of morphinism, or his explanation of the increased destruction of morphin observed in connection with it. With this conception we are able to connect the pharmacological fact that the sensitivity to the paralyzing effects of morphin among vertebrates increases with the higher development of the nervous system and also that addiction develops more easily in these more highly developed individuals.

"In addition, it is evident from my own experiments that morphin and heroin are in the main alike as regards their destruction. The fact that addiction was observed for heroin also is in accord with this. The Fröhde reagent separates the morphin derivatives rather remarkably into two groups: morphin and heroin, which are eventually destroyed, react directly to it: codein and its nearest higher homologue, dionin, which, to our knowledge, are not destroyed in the animal body, do not react with the characteristic color to it directly, but only after formalin has been added. Babel thinks that in both cases, i.e. both in the destruction by the organism and in the Fröhde reaction, this behavior is to be explained by the firmer binding of the ester. Heroin, also an ester, shows, however, as proved by our experiments, less resistance against destruction by the growing organism than morphin. Perhaps physical qualities play a part in this quantitative difference between the two alkaloids. Babel has already demonstrated the higher solubility of heroin in fat as against morphin. For comparison I determined the solubility in water, which I did as follows:

"Finely powdered heroinum basicum was placed in a cylinder and covered with distilled water. This was allowed to stand for 36 hours, being frequently shaken for about a minute. The solution was then filtered off, and 100 cc. of it allowed to evaporate in a weighed glass vessel, dried at 102°C. and weighed, whereupon it was discovered that:

100 cc. distilled water at 20°C. dissolve: 0.0922 heroin basicum
100 " " " " " " 0.0923 " "

"Winterstein obtained by the same method of determination the following figures for the morphin base:

100 cc. distilled water dissolve at 20°C.: 0.0264 morphin basicum
100 " " " " " " 0.0250 " "
100 " " " " " 18°C.: 0.0248 " "

"This considerably greater solubility of heroin as against morphin, in both media, water and fat, explains on the one hand the fact that this alkaloid penetrates more quickly than morphin into the cell and thus produces more quickly and more intensively its specific poisoning; and on the other hand, these physical relations probably exert a favorable effect on the complete destruction of heroin by the protoplasm. But in connection with the latter fact something else must be given consideration. We know that the higher individuals, especially human beings, are much less sensitive to codein and dionin than to morphin and heroin. The body becomes habituated to the first two substances only with great difficulty. There appears, consequently, to exist a definite relation between the manner of esterization on the one hand, and the effect and habituation, on the other. The alkyl closing of phenolhydroxyl is manifestly a very firm one. This is, therefore, the group in which lies the cause of diminished habituation or capacity to destroy, whereas the greater virulence and easier habituation, along with easier destruction, of heroin is explained by the fact that both acetyl groups are split in the organism comparatively easily, as a result of which both hydroxyl groups become free and especially ready for reaction. Cloetta and Waser succeeded recently in demonstrating in typical manner for the same substance, tetrahydro—B—naphthylamin, this difference between acetyl and alkyl residue with reference to their capacity for being split off in the body. It was, in fact, a matter of the substitution of a hydrogen of an NH_2 group.

"There still remains to be determined what becomes of the morphin and heroin when they are destroyed in the organism.

"The best known oxidation product of morphin is oxydimorphin, which forms readily in the case of an alkaline reaction through the influence of atmospheric oxygen and, in any case, in the presence of an oxydase. It is, however, not very probable that the oxidation of morphin in the animal organism should follow this course. Besides, this product would not escape demonstration by the Fröhde reaction, since its reaction is identical with that of morphin. Corresponding to the degree of oxidation, however, there develop various decomposition products, which are chemically less well known. In all my experiments in which morphin was destroyed by the embryo, I observed an irregular Fröhde reaction—namely, the reagent showed a pink coloring for a long time. This led me to think that a decomposition product of morphin or heroin might be the cause of it; for in all other investigations I did not find this reaction. Unfortunately, the quantities employed were much too small to permit any determination as to the nature of this decomposition product.

"Occasionally Marmé found in intestinal excrements and in extracts from the lung and liver of morphinized dogs, when the latter had had for some time subcutaneous injections of rather large but not fatal doses of morphin, a substance which did not turn violet with Fröhde's reagent, but pure blue and then green. In acute, fatal poisoning with morphin he did not find this substance. He believed that oxydimorphin was involved, the reaction for which had been thus given by Polstorff. Donath then showed that the Fröhde reaction was the same for morphin and oxydimorphin; consequently, the substance described by Marmé could not be oxydimorphin. I, too, have twice seen this blue color with Fröhde's reagent: once in the case of an egg which had grown mouldy while in storage (naturally, it was not included in the investigations); and the other time, when I had macerated pure morphin with PbS and water containing H_2S for about two months, in order to see whether in the case of a possible colloidal solution of PbS, the latter could have any influence on the morphin. The latter case surely involves reduction processes, the first very probably; for we know a number of such processes which may be started in inorganic and organic substances by means of mushrooms. Perhaps similar processes are involved in the findings of Marmé.

"SUMMARY.

"Solutions of morphin, heroin and codein, may be injected into fertilized and incubated hen's eggs without necessarily hindering the development of the embryo, if the dose of about 2 cg. is not exceeded.

"The conclusions arrived at by means of an extremely detailed technique as regards alkaloids so injected are as follows:

"If the embryo is completely developed, heroin is always completely destroyed, morphin 50-100%, codein not at all. Increased supply of O_2 during the incubation also brings complete destruction of morphin.

"If the development has gone only about half way and death has then occurred, all the alkaloids are recovered in full. Hence it follows that a certain morphological stage of development is required for the two alkaloids to be destroyed.

"The embryo with injection is to be regarded as a chronically poisoned individual. In analogy with facts already established for the chronic poisoning of adult animals, destruction occurs here also only in the case of morphin and heroin. Codein remains unaffected.

"Experiments with increased and diminished supply of oxygen during incubation as well as other results are evidence of the fact that the destruction of the alkaloids, which has been described, is accomplished by the completely developed embryo by way of oxidation.

"The reason why morphin and heroin lead to addiction, and are incidentally destroyed, whereas codein and dionin do not, lies in the manner of the esterization of the phenolhydroxyl. That heroin is most easily destroyed—disregarding its greater solubility in water and oil—is evidently connected with the fact that both acetyl groups are easily split off in the body."

Walter M. Kraus—1918.[77]

"The object of this paper is to explain the cause of the nature of the symptoms of withdrawal in chronic morphinism. Briefly summarized, the symptoms are simply the opposite to those produced by the action of morphin.

---

[77] Kraus, Walter M.—An Analysis of the Action of Morphine upon the Vegetative Nervous System of Man. J. Ner. and Men. Dis. Vol. 48, No. 1, July 1918.

"The reason that any vegetative symptoms appear is that, in the course of acquiring an increased tolerance to the drug, the threshold of irritability of the vegetative nervous system is gradually raised. Were this not so, two things would happen: *there would be continual occurrence of symptoms while the drug was used in tolerated doses, and there would be no symptoms upon withdrawal.*

"As has been shown in the first part of this paper, morphine causes functional depression."

* * * * *

"The explanation of this sudden reversal of symptoms lies in the fact that morphine taken as a habit-forming drug upsets the normal equilibrium between the sympathetic and the autonomic systems, establishing a new one. When this new equilibrium is destroyed by taking away the drug, symptoms naturally result."

* * * * *

"The symptoms which have been described are all attributable to the lack of the effect of *morphine* upon the organism—more particularly upon the vegetative nervous system. *They are clearly the opposite to those produced by morphine, and thus serve as a further proof of the effects of its action."*

A. G. Du Mez—1919.[78]

Du Mez, 1919, after a review of the literature, comes to the following conclusion as to the mechanism of tolerance:

"From the foregoing review of the literature, it becomes apparent that, up to the present time, all investigators have failed to demonstrate the exact nature of the factors that enable the system, in the case of either animals or human beings, to tolerate enormous doses of these drugs or to identify the substances that give rise to the withdrawal phenomena. The only knowledge of a positive nature that we really have, at present, concerning these problems is that the different organs and centers of the body acquire tolerance to morphin and heroin to a different degree and with varied degrees of readiness; that these drugs, as such, are excreted in the feces in diminishing amounts during the period of acquiring tolerance; and that there is evidently present in the blood serum of tolerant animals (dogs) during periods of abstinence, a substance or substances which, when injected into normal animals of the same species, causes the appearance of symptoms identical with the so-called withdrawal phenomena. Whether or not the disappearance of these drugs from the feces is due to their increased destruction in the organism is still an unsettled question. Attempts to solve this problem through a chemical examination of the excretions have led only to confusion, the literature being replete with contradictory results. Furthermore, it has not been proved that the destruction of morphin in the organism, if it does take place to an increased degree, is a causative factor in the production of tolerance. As stated before, it may be only a concomitant phenomenon."

---

[78] Du Mez, A. G.—Increased Tolerance and Withdrawal Phenomena in Chronic Morphinism. J. A. M. A. April 12, 1919. 72: 1069.

E. J. Pellini and A. D. Greenfield—1920-1924.[79] [80]

Pellini and Greenfield, believing that the work reported on antibody-formation in chronic opium intoxication had not been wholly satisfactory inasmuch as it was either conflicting or uncorroborated, undertook a series of experiments to determine whether the continuous taking of morphin caused the presence in the blood serum of a substance which had a protective action against morphin. In these experiments, the authors endeavored to determine whether the serum of humans accustomed to morphin and that of morphinized dogs conveyed immunity to mice and cats.

Before undertaking the actual experiments, however, not feeling satisfied with the results of previous workers, they determined for themselves the minimal fatal dose for the mice, and found it to be between 0.3 and 0.4 mg. per gram weight of mouse.

In a series of 10 mice these authors injected 1 cc. of the serum, taken 8 hours after the last administration from a dog which had been made tolerant to 80 mg. over a period of three and one-half months. Three to four hours later 0.4 mg. morphin sulphate per gram weight of mouse was injected. Seventy per cent died within a four-hour period. The same procedure was followed in a second series, using the serum of a human case, whose blood was withdrawn three and one-quarter hours after the last administration. In this series the morphin sulphate was injected in the mice 18 hours after the serum. Seventy per cent of the mice died. Similar results were obtained with doses of 0.3 mg. morphin sulphate; out of 6 mice injected, three died and three survived.

The authors did not attempt to determine the M.L.D. for the cats, because of difficulty in securing a sufficient number, but on the basis of Gioffredi's work, namely, that he was able to protect young cats from doses varying from 0.05 to 0.14 g. morphin per kilo., they chose 0.07 and 0.08 g. per kilo. The serum of humans was used. Two cats to which 0.08 g. morphin sulphate per kilo. was given one-half hour before 10 cc. of the serum died within two and one-half hours. Of two cats to which the same dose of morphin was given simultaneously with the serum, one died and one survived. Of three cats to which 0.07 g. per kilo. was given a short period (within two hours) after the serum, one died within two and one-half hours and the other two died overnight. All six cats, to three of which 0.08 g. and to the other three 0.07 g. per kilo. morphin sulphate were given 18-24 hours after the serum, died within one and one-half to four hours.

---

[79] Pellini, E. J. and A. D. Greenfield—Narcotic Drug Addiction. I. The Formation of Protective Substances against Morphin. Arch. of Int. Med. Sept. 15, 1920. Vol. 26. p. 279.

[80] Pellini, E. J. and A. D. Greenfield—Narcotic Drug Addiction. II. The Presence of Toxic Substances in the Blood Serum in Morphin Habituation. Arch. of Int. Med. May 15, 1924. Vol. 33. No. 5. pp. 547-565.

The following is their summary:

"We wish to emphasize the following features of our work:

"1. The difficulty attendant in determining a minimal fatal dose of a drug, especially calling attention to the factor of uniformity of absorption of subcutaneous injections.

"2. That the minimal fatal dose of morphin sulphate for mice is a question which depends very largely on the technic followed; with our technic it proved to be between 0.3 to 0.4 mg. per gram weight of mouse.

"3. The acute stage of morphin intoxication has reached its height within four hours after the subcutaneous injection, and recovery usually occurs if this period is survived.

"4. That serum of the blood of a dog tolerant to morphin sulphate does not protect mice against a minimal fatal dose of morphin sulphate.

"5. That the serum of the blood of human addicts does not protect mice against a minimal fatal dose of morphin sulphate.

"6. That 100 cc. of serum of humans addicted to morphin did not protect cats from doses of from 0.07 to 0.08 gm. of morphin sulphate per kilogram regardless of the sequence or of the interval of time elapsing between the injection of the serum in relationship to the injection of the morphin sulphate.

"7. The morphin tolerance does not develop immunizing properties in the serum either of dogs or of human beings.

"It will be seen that our work gives results which are in direct conflict with the claims of Gioffredi, Hirschlaff and von Marikovsky, all of whom believed that they had established definite protective substances in the serum of morphin tolerant animals."

* * * * *

"The researches in immunology bearing on the nature and mechanism of serum immunity have in recent years tended to make it constantly more probable that such immunity is produced only by proteins, and that the tolerance established to certain vegetable alkaloids is of a totally different nature.

"Conclusion:—1. We consider that the definite conclusion to be drawn from our work, which, so far as we know, is the only work of this nature directly testing the question of immunity acquired by the human morphin addict, is that no substance is formed in the blood serum of a human being who has acquired a high tolerance to morphin, which is capable of conferring any degree of immunity to the toxic action of morphin on an animal into which it is injected.

"2. Likewise we have been able to show that the blood of a tolerant animal does not contain any protective substance against morphin."

Later in 1924, Pellini and Greenfield report[81] a study of the question of "whether any specified toxic substance is produced by morphin habituation." They continue:

> "This question, which is closely related to the first, has a more direct practical bearing on the current theories of the nature of morphin addiction and the causation of withdrawal symptoms, and also on treatment. There has been considerable controversy on this subject, and a more or less widespread belief that there is such a substance, and that it is the cause of the well known symptoms of morphin withdrawal when no longer neutralized by the continued administration of morphin; and some methods of treatment of drug addiction have been founded upon this belief.
>
> "The scientific basis for this conception originally rested upon the work of Marmé, who reported the finding of oxydimorphin in the feces, lungs and liver of dogs habituated to morphin. He further stated that oxydimorphin produced symptoms similar to those of morphin withdrawal, when injected into nontolerant dogs. Marmé's results have been disproved by numerous subsequent investigators.
>
> "The belief is at present based solely upon the work of Valenti, who in 1914, reported a series of experiments in which he investigated the effects produced on the circulation of normal dogs by the intravenous injection of serum of the blood of dogs accustomed to increasing doses of morphin, and which were in withdrawal when the blood was obtained. Since his results have never been tested by other investigators, we have made the study of this question the subject of the present paper."

These authors morphinized a male dog, weighing 17.5 kg. over a period of ten months, beginning with a daily dose of 10 mg. morphin hydrochlorid administered subcutaneously, and reaching 2.75 g. during the last months. After electrocardiographic studies of the heart rate of other morphinized dogs at various stages of withdrawal, which led them to conclude that the heart rate rose after withdrawal to a maximum point reached in about forty hours, they drew the blood for the present experiment forty-one and one-half hours after the last dose had been administered. Electrocardiac observations were made on this dog.

To prevent the occurrence of circulatory variations from the degree of anesthesia, these authors were able to maintain a uniform rate of ether administration by employing the method devised by Dr. Ben Morgan. The serum of the morphinized dog was injected into the left external jugular vein, upon exposure, through a cannula. A control was also used, in which normal dog serum was injected into a normal dog.

---

[81] Loc. cit.

The following table gives the heart rate and blood pressure readings. The authors continue:

> "Comparison of the records obtained with normal serum and serum of the morphinized dog in withdrawal shows no such effects of the latter as were described by Valenti, but in view of the disparity between our results and his, we felt that additional work along somewhat different lines would be desirable, and next proceeded to electro-cardiographic studies. By this procedure, we were enabled to dispense entirely with anesthesia and thus avoid any possible disturbing factor that might be due to the anesthetic. Moreover, it afforded a more sensitive means of testing the heart and rhythm."

After a preliminary period of training a dog to undergo the injections without anesthesia, electrocardiographic studies were made first after normal serum and then after the serum taken from the morphinized dog in withdrawal had been injected, with all other conditions being identical with those of the preceding experiment. The authors state:

> "Comparison of these results with those of the preceding experiment shows no effects from the serum of the morphinized dog in withdrawal comparable to those shown by Valenti.
>
> "Besides studying changes in heart rate, the electrocardiograms were analyzed also for the maximum variations in the auricular complex, the ventricular complex, the complete cardiac diastole, the sequence and the rhythm of the heart. The results of the analysis did not show any effect that could be attributed to the serum of the morphinized dog in withdrawal and such variations as occurred were fully explained by respiratory sinus arrhythmia.
>
> "Since the foregoing experiments were confined to a study of possible effects on the circulation, we thought it desirable to extend the scope of our investigation to include other studies which might throw light on the effect of the serum, such as possible effects on the central nervous system or on the chemical composition of the blood.
>
> We therefore conducted, concurrently with our experiments on the circulation, two other series, in one of which we endeavored to ascertain by observation of the behavior and general symptoms of cats injected with such serum, whether any effects were produced, especially any referable to the central nervous system. Our technic in this series was as follows: The cats, which were not anesthetized, were placed in a box from which the head and neck alone projected; the external jugular vein was exposed just sufficiently to permit the insertion of a hypodermic needle, and 10 c.c of serum was quickly injected by means of a syringe. The cat was then immediately released, the whole procedure described taking not more than three or four minutes. The animal was then kept under close observation for an hour or more, being allowed to roam at will in the laboratory. Six cats were injected with serum, and Table 7 gives data regarding the dog serum used in each case.
>
> "In all cases, the behavior of the cats was entirely normal, and they showed no effects from the injection of the serum.

TABLE X*

Effect of Serum of Morphinized Dog in Withdrawal

Time	Heart rate per min.	Blood pressure in mm. Hg	Remarks
(a) 2:05	180	170	Before injection
2:10	195	171	Before injection
2:15	192	168	Before injection
(b) 2:20	195	166	Before injection
			Injection of serum started (rate 1 c.c. per min.)
2:25	186	163	After 5 c.c. of serum
(c) 2:29	186	158	After 9 c.c. of serum
2:32	187	164	After 12 c.c. of serum
2:35	187	168	After 15 c.c. of serum
2:38	192	166	After 18 c.c. of serum
2:41	192	164	After 21 c.c. of serum
2:44	195	162	After 24 c.c. of serum
(d) 2:47	198	158	After 27 c.c. of serum
2:50	195	158	After 30 c.c. of serum
2:53	195	166	After 33 c.c. of serum
2:56	190	164	After 36 c.c. of serum
2:59	190	164	After 39 c.c. of serum
3:02	190	168	After 42 c.c. of serum
3:05	186	164	After 45 c.c. of serum
(e) 3:08	192	172	After 48 c.c. of serum
3:11	195	170	After 51 c.c. of serum
3:14	195	162	After 54 c.c. of serum
3:17	195	164	After 57 c.c. of serum
3:20	195	166	After 60 c.c. of serum
3:23	195	164	After 63 c.c. of serum
(f) 3:26	187	162	After 66 c.c. of serum
			Injection stopped
3:29	195	162	
3:32	195	158	
(g) 3:35	195	159	
3:38	195	160	
3:42	195	162	
(h) 3:45	195	162	

	Before injection	After injection
Blood pressure in mm. Hg		
Highest	171	172
Lowest	166	158
	5	14
Heart rate per min.		
Highest	195	198
Lowest	180	186
	15	12

---

* From—Pellini, E. J. and A. D. Greenfield—Narcotic Drug Addiction. II. The Presence of Toxic Substance in the Blood Serum in Morphin Habituation. Arch. of Int. Med. May 15, 1924. Vol. 33. No. 5. pp. 547-565.

"Our final series consisted in analysis of the blood of morphinized dogs in withdrawal. The analysis of the blood was performed according to the methods of Folin and Wu and of Van Slyke. The blood used was obtained from the dogs and at the times described in Experiments 2, 4, 5 and 6 of Table 7. Table 8 gives the results.

"Table 7—Data Regarding Serums Used for Cat Experiments

Experiment	Period of addiction	Daily dose of morphin at close of period	Time of drawing blood after withdrawal of morphin
1.......	3 months	0.4 gm.	2 days
2.......	6 months	3.0 gm.	3 days
3.......	3 months	0.5 gm.	2 days
4.......	10 months	2.75 gm.	41½ hours
5.......	1 year	1.0 gm.	3 days
6.......	1 year	1.0 gm.	18 hours

"The foregoing results are well within the range of normal dogs' blood.

"Before comparing our results with those of Valenti, it may be desirable to make a few comments on his report. One of the features of his results to which he attaches great significance is the marked increase in range of variations in blood pressure and heart rate, after injection of the serum of a morphinized dog in withdrawal, as compared with the range in the normal period before injection. His method of obtaining this result from his records is to select the highest and lowest points, wherever they may occur in the normal period and in the period after starting the injection, respectively, and compare the differences. We find a few instances of errors made by him in the selection of these figures from his records, but this does not affect the general nature of his results. In reporting that phase of our work, which was an attempt to duplicate his, we adopted the same method in order to permit of exact comparison, but we were unable to appreciate the significance of this particular feature of the results.

"Table 8—Chemical Analysis of the Blood of Morphinized Dogs in Withdrawal.

	Dog 2	Dog 4	Dog 5	Dog 6
	mg.	*mg.*	*mg.*	*mg.*
Nonprotein nitrogen..............	30.0	31.0	29.0	28.8
Urea..........................	17.2	15.0	15.4	13.4
Creatinin......................	1.2	1.5	1.2	1.2
Uric acid.......................	1.0	1.0	2.3	2.0
Sugar..........................	110.0	104.0	75.0	76.9
Whole blood chlorids.............	450.0	544.5	475.0	585.0
Carbon dioxid...................	52.2%	50.0%	52.0%	56.6%

"Examination of his tables shows that, in the majority of instances, the extreme high and low points of both the heart rate and blood pressure occur at various points in the progress of the experiment, and that both the heart rate and the blood pressure range up and down throughout the experiment, rather than following a definite and consistent course. It is hard to conceive of any substance which, when injected at a uniform rate into the veins of an animal, would be capable of producing such an irregular effect. Similar effects can be produced by substances which are rapidly absorbed and excreted, when not administered uniformly. It is well known that ether administration, when not under exact control, will produce these effects. It will be noted that, as already stated, Valenti does not specify the form of anesthetic used in his experiments. It appears, however, that in his control experiments, using normal dog serum, he reports much smaller variations, and we are unable to offer any explanation of these observations. In our work, as will be seen from our tables, we obtained no results showing any substantial difference, as regards variability in heart rate or blood pressure, between the effects of the serum of a morphinized dog in withdrawal and those of normal dog serum. The slight differences occurring were more marked following the injection of normal serum.

"Another feature of Valenti's reported results on which he lays much stress is the arrhythmia, which he states is produced by the injection of the serum of a morphinized dog in withdrawal. We have given sections of his tracing which he selected as showing three different types of arrhythmia. We have also given sections of our tracings for comparison. Our results do not correspond with his, as the tracing of our experiment with such serum shows no arrhythmia. The variations of rhythm shown in our tracing of the dog injected with normal dog serum are of the type obviously associated with respiratory changes.

"The electrocardiographic method is, of course, much better adapted to show these features of the heart action than the mercury manometer, and it is naturally to be expected that if arrhythmia were produced, it would be plainly apparent in the electrocardiograms. Our electrocardiographic studies show no abnormal arrhythmia. Such changes in rhythm as appear are, in the first place, uniform in all our electrocardiographic experiments, and, in the second place, clearly respiratory, as may be seen by comparison with the respiration curve. It is worthy of note that in the electrocardiographic experiments no anesthetic was used.

"Valenti finds that the degree of circulatory disturbance produced by the injection of the serum of the morphinized dog in withdrawal is directly dependent on the total amount of morphin consumed during the addiction period. The largest total amount consumed by any of the dogs from which he obtained serum for injection was 69.95 gm. The serum in the experiments on the circulation presented by us was obtained from a dog that had received a total of 168.62 gm. If his conception is correct, our results should have been much more pronounced than his. The same reasoning applies in a measure to the question of the length of time of withdrawal of the morphin. While Valenti claims that the serum is equally effective when the blood is drawn at any time from thirty-six hours to twenty days after stoppage of morphin administration, we ascertained by electrocardiographic studies that there was a definite time at which the circulatory disturbances in the morphinized dog were at their maximum, and the serum used by us was obtained from blood drawn at that time.

"We feel that our work on cats and blood analysis is corroborative of our negative findings. We also feel that the conclusions reported in our first paper of this series have a definite bearing on the question now under discussion. We there reported that the serum of morphin addicted dogs and humans had no protective effect against a minimal fatal dose of morphin. If there was any toxic substance in the blood causing circulatory changes which, as Valenti claims, could be neutralized in its physiologic effects by the administration of morphin, it is difficult to conceive the nature of such substance unless it is either chemically or physiologically an antidote to morphin. Our previous work shows conclusively that no such substance is present.

"A notable point in Valenti's report is the statement that the circulatory disturbances in morphinized dogs can be suppressed, and the normal circulatory condition restored, at any time from thirty-six hours to twenty-one days after withdrawal, by administration of the previously accustomed daily dose of morphin. He emphasizes the fact that this effect cannot be produced by any amount less than the previous daily dose, and that it is only when this amount is exceeded that the typical 'morphin pulse' becomes evident. Such persistence of tolerance as he reports is directly contrary, not only to the generally known facts in the case of human beings, but also to the results of careful experiments on animals by competent investigators. Cloetta, experimenting on rats and pigeons, found that these animals lost their tolerance as early as two days after the withdrawal and that the previous daily dose, if of a size fatal to a normal animal, proved fatal to these previously tolerant animals after this lapse of time. Van Egmond shows that in dogs accustomed to tolerate 1 gm. of morphin daily, the vagus still responds to the injection of minute doses. He found it possible to change the heart rate from 120 to 80 per minute by a dose of 0.04 gm., while doses as small as 0.00008 gm. per kilogram in these same animals showed an appreciable effect. Van Dongen and Tamura also found that the vagus center does not become tolerant to morphin. In the course of our work, we found that profound general effects were produced by the injection, three days after the withdrawal, of a previous daily dose of 1 gm., and these were noted very promptly, being quite pronounced within twenty minutes or less time.

"We feel that Valenti's failure to give important details of his technic (e.g. the anesthetic used), the peculiar way in which he arrives at his conclusions by selection of figures from his records, and the impossibility of rationally reconciling his results with those of other workers who have investigated different aspects of the effects of morphin tolerance, and whose conclusions have met with general acceptance, lend weight to the conclusions to be drawn from the consistently negative results of our own work. We feel that our technic was such as to eliminate possible extraneous factors that may have influenced Valenti's results, and that the conditions under which our work was performed were even better calculated to obtain clear positive results from any toxic substance that might be present in the blood.

"Conclusions.—1. No toxic substance is formed in the blood of dogs habituated to morphin which is capable of producing circulatory disturbances in normal animals into which the serum is injected.

"2. We find no evidence that any toxic substance is present in the blood as a result of morphin habituation."

H. C. Lane—1920.[82]

Lane reports, as follows, a method for detecting chronic opium intoxication by means of a hemolytic reaction:

"The finger of a suspected opiophagic patient is stabbed with an automatic lance. The blood is drawn into a Gower's blood pipet holding .2 c.c. This is expelled into a small test tube five by one cm., containing one c.c. of normal saline solution. This is repeated for five more saline tubes. The tubes are numbered 1-2-3-4-5-6. Shake each tube gently immediately after the blood is introduced. Prepare two more saline tubes and number them 7 and 8. If any shreds or clots of blood should be present, remove them with a sterile platinum wire. As a rule they will not be present.

"Tubes 1 and 2 are controls, containing only saline solution and blood. To tubes 3 and 4 add .2 c.c. of a 1-100 solution of morphine sulphate in distilled water. The solution should be neutral, it must not be either acid or alkaline, therefore it should be tested with red and blue litmus paper and with phenolphthalein and methyl orange indicators. To tubes 5 and 6 add .2 c.c. of a 1-200 solution of morphine sulphate made with a good grade of the drug in distilled water. Tubes 7 and 8 contain the blood of normal individuals.

"After standing at room temperature out of the light for some twelve to twenty-four hours or even less, tubes 1 and 2 (controls) show complete inhibition of hemolysis with a clear supernated fluid. Tubes 3 and 4 show almost complete inhibition of hemolysis with a very cloudy supernated fluid. This flocculent flaky appearance is the positive test for a drug habitué. Tubes 5 and 6 show a modified flocculent appearance of supernated fluid. Tubes 7 and 8 (true controls of normal blood) show a clear supernated fluid with complete inhibition of hemolysis. I would like to caution the investigator that upon agitation of the tubes, the flocculent deposits settled to the bottom of the tubes. The tubes should be placed against a black background, in order to accurately interpret the results, as a clear bright light obscures the readings.

"It is also possible that the reaction takes place with any of the narcotic drugs such as heroine, codeine, and others. The blood of a drug user has amboceptor with at least one narcophore binding cell which has an affinity for the drug the patient is taking. This is a rapid method of testing the blood of a drug addict, as the blood does not have to be passed through the lower animals to secure antiserum. All the glassware should be sterile, the technic is simple and any one can do the test. The test may also be done with rabbit serum which has been sensitized with the blood serum of a drug habitué. I do not state that this test is perfect but in the course of time it should be made an aid to diagnosis."

---

[82] Lane, H. C.—New Method for Detecting Drug Habitués. N.Y. M.J. Aug. 14, 1920. Vol. 112. p. 222.

E. S. Bishop—1920.[83]

"Tolerance or an immunity to the toxic effects of narcotic drugs are primary and striking characteristics in the development of addiction. An antitoxin or antidotal substance is the recognized mechanism of their production in most diseases admittedly developing these characteristics. I have adopted the hypothesis, therefore, that an antidotal substance is manufactured by the body as a protection against the poisonous effects of narcotic drugs constantly administered. Such a substance, manufactured in the body, being antidotal to morphine, might well possess toxic properties of its own, exactly opposite in manifestation to those possessed by morphine and other opiates. Toxic substances exactly opposite to opiates in their action might readily account for the severe withdrawal signs, parallel in their extent to the extent of opiate insufficiency, and resembling in their characteristics the manifestations of acute poisoning.

"A hypothetical antidotal toxic substance, manufactured by the body as a protection against the toxic effects of continued administration of an opiate drug, will therefore explain the well-known development of tolerance and immunity in these cases, and will account for the violent physical withdrawal signs. In a word, it will explain the disease fundamentals on a definite physical basis.

"Such an hypothesis will explain the stage of development of addiction before outlined. In the stage of tolerance the antidotal toxic substance has begun to make its appearance in the body and to protect it against slight narcotic excess, but its manufacture is not sufficiently established to continue longer than necessary to neutralize the narcotic administered. In the stage of beginning addiction, or beginning narcotic-need, its manufacture has become more developed and more constant and proceeds for a longer time after the discontinuance of the narcotic drug. In the stage of fully developed addiction, or absolute narcotic need, the manufacture of the antidotal toxic substance has become practically an established pseudo-physiological body-process, and will continue long after the administration of the narcotic drug for reasons into which I have gone elsewhere. In other words, in narcotic drug addiction some antidotal toxic substance has become a constantly present poison, and the narcotic drug itself has become simply the antidote demanded for its control. In brief, fundamentally and basically, narcotic drug addiction is a condition presenting definite physical phenomena, symptoms, and signs, due to the presence within the body of some autogenous poison requiring narcotic drug for neutralization of it or of its effects.

"This explains the phenomena of the mathematical exactness with which the minimum daily need can be estimated under experimental conditions, and with which doses less than the amount of actual body need relieve existing withdrawal signs in definite proportion to the amount of opiate administered. In exact proportion as the drug of addiction is present in the body to neutralize or oppose some antidotal poison, is the patient free from withdrawal symptoms and from physical craving for the narcotic drug.

"The development and existence of such mechanism in the body of the opiate addict is suggested also by the apparent continuance of tolerance to opiate existing after long periods without drug in individuals who had previously suffered from addiction-disease, and in the susceptibility of the former sufferer subsequent to the arrest of his physical need for opiate, to the re-establishment of that need by the subsequent administration of the drug."

---

[83] Bishop, E. S.—The Narcotic Drug Problem—1920.

K. Schübel—1920.[84]

This author studied the changes in the chemical composition of the central nervous system and in metabolism in general not only during chronic opium intoxication but also during withdrawal in four dogs. From his observations of the variations in the nitrogen, purin and phosphoric acid elements in the urine and feces, he concludes as follows:

"The severe symptoms which are observed during morphin withdrawal have primarily a gastro-intestinal origin. They are functions of the digestive organs. If the morphinist continues to take the poison 'secretion narcosis' becomes greater. If the supply is interrupted there is a sudden hypersecretion which in turn acts as a strong stimulant. In addition to this peripheral action on the digestive apparatus there are also involved alterations in the central nervous system in connection with the production of withdrawal symptoms.

"The findings resulting from my experiments on metabolism in dogs, especially the simultaneously increased elimination of purin base and phosphoric acid, supports my opinion that the central nervous system undergoes alterations in its normal composition on long continued morphin administration, which during addiction, because this is formed very gradually, produces no severe symptoms. But the sudden interruption of the morphin supply has the effect of a sudden lack of an integral part of the nerve cell which produces the given severe symptoms. We make no mistake in assuming that the basic morphin or its decomposition products can replace other basic substances of the nerve cell during addiction. The omission of this new basic constituent of the nerve cell produces alterations in the chemistry of the cell and functional disturbances which are distinguishable without further analysis."

C. C. Wholey—1913-1922.

From the writings of Wholey, from his replies to our questionnaire, and from recent correspondence, we have taken the following:

"Opiumism is a chronic drug intoxication resulting from the use of opium or its derivatives to a stage of abnormal tolerance, and characterized by pathologic somatic and psychic changes, chiefly chemico-metabolic, secretory and neuro-psychiatric, in nature."

* * * * *

---

[84] Schübel, K.—Stoffwechselversuche an Hunden während der Gewöhnung an Morphin und während des Morphinhungers. Arch. f. exp. Path. u. Pharm. 1920. Vol. 88. pp. 1-29.

"Opiumism ultimately brings about a neuro-psychopathic state which more or less permanently and profoundly alters the personality. This alteration is probably induced by the pathologic effect of the drug upon the body chemistry. The psychopathology evidences itself by the varying degrees of dependency, delinquency, and often of depravity, noticeable in victims of this disease-condition.

"This artificially induced psychopathologic state is similar to, if not identical with, that found in many cases of so-called psychopathic personality or constitutional inferiority. In one case the condition is induced, in the other it is inherent. Although opiumism may induce, as stated above, alteration and deterioration of personality, it must not be thought that every such degenerate state, in victims of the drug, was brought about by its use; in many of them, this inferiority existed before the drug was taken and frequently accounted for its beginning use.

"We assume the unity of the organism and the common evolution of soma and psyche. When an opiate drug is taken (with or without the knowledge of the patient) to the point of physical tolerance, or in other words, to such an extent that the body cells cannot function comfortably without it ('cell dependence'), withdrawal symptoms develop on abstinence from its use, and a psychopathologic status has been established. But if the taking of the drug continues, this psychopathology becomes more and more firmly fixed. With larger doses and longer use 'cell dependence,' of course, increases in intensity. It is obvious that when an individual continues the use of the drug deliberately, there is an added element of character weakness, or deterioration present.

"When the human organism has become definitely adjusted to the drug (the length of the period of adjustment varies with the individual), it has become the pivotal point around which interest chiefly revolves; without the drug craving and bodily discomfort supervene. The emotional tone has become abnormal, maintained as it is, upon an artificial metabolism. Normal sensations are obtunded, or shut out; and the sense of well-being, or coenesthesia, does not correspond with reality. The sensory system does not report correctly, thus perverting judgment, and coloring emotion. One has but to recall the instantaneous transition from despondency to exuberance when an overdue dose has been administered. Again the individual will insist that the drug is beneficial, though he is on the brink of mental and physical collapse.

"In any state of illness the emotional tone is changed and judgment, therefore, impaired to some extent. But in opiumism this false emotional status, kept up by the drug, becomes, as it were, chronic, and the victim's outlook upon economic, social and other relationships conforms to a false sense of well-being, or security."

In discussing Bishop's theory of an antitoxic substance, Wholey [85] states that Bishop does not emphasize sufficiently the part played by the nervous system in the symptomatology of opiumism, and that the nervous system through constant inhibitions becomes pathologic in its reactions. Whether the toxic effect on the nervous centres is due to the opium or to an antitoxic substance, or not, we have a disease syndrome which must be "treated in the light of nervous and psychic deterioration." He states that while we must not lose sight of organic disturbances and the treatment they require, back of all such disorders, "whether secretory, trophic or cardiovascular, there exists a deranged nervous system, the etiologic factor in their causation."

---

[85] Wholey, C. C.—The Inadequacy of Bishop's Antitoxin Hypothesis to Explain fully the Symptomatology in Morphin Addiction. J.A.M.A. March 1. 1913.

"By locking up the secretions and otherwise interfering with the normal metabolic action of the organs, including the nervous system and brain, morphin induces a disturbed or painful coenesthesia—a sense of general bodily discomfort—which may become unbearable."

* * * * *

"Opium intoxication differs from that of the other common chemical or bacterial intoxications, in that it is so intimately bound up with the individual's adaptations to his environment. The peculiarity of this drug is its obtunding of all sensory avenues, upon which the individual depends, for accurately putting himself in touch with his surroundings; it causes his senses to misinform him, on the side of euphoria or well-being, thus producing an ever increasing lowering of his threshold of resistance to painful or unpleasant sensations of situations. As a result of his habitual obviation of effort by further insensitization, he side-steps the normal effort to meet the common difficulties and obligations of life. . . . Thus is brought about that character deterioration which is always seen in the drug addict and which varies according to the individual's original fibre. The higher mental qualities constituting character regain their former vigor only after a lengthy absence from the drug and when complete organic rehabilitation has taken place. This delayed character (will power, proper ethical value, etc.) re-establishment is, to my mind, the main factor in the causation of relapses."

"A physiologic and psychic need for continuance has usually been established, before the morphinist finally reaches the place where he realizes his condition sufficiently to seek a physician; he has undergone marked changes in body chemistry, and in mental processes and in estimation of ethical values. He presents the picture of abject neurasthenia. He is afraid to continue his drug and has no courage to contemplate the discomfort of discontinuing it. His nervous and mental degeneracy manifests itself largely in fear, which dominates his conduct. He fears death, he fears his ability to carry through the day's work; he is afraid of falling into poverty, and is obsessed by the fear that he will not sleep. This factor of fear makes for the continuance of the habit and accounts largely for many relapses when the drug has seemed to be successfully withdrawn.

"The comparison of opiumism with any other toxic disease (except those arising from other narcotic habit-forming drugs), or bacterial disease, must take into account the intricate habit involvement uniquely existent in narcotic drug addiction. Aside from the mere routine matter of getting a patient off his drug, there would practically be no opium problem, if it were not for the habit involvements and abnormal memory-associations which have been set up by the use of the drug. A neuro-psychasthenic state has been produced by the use of the drug during the stages of habit formation. If it were not for the peculiar memory-associations having to do with the comfort and sense of security induced by the drug, and to the fixed habit of turning to it, either as a bolster, or a solace, its victims would resort to the customary channels for the care and treatment of the resulting psychoneurasthenic states, just as they would have done if their illness had resulted from other causes. If other toxic, or germ-born diseases were rigidly comparable in their effects with those of opiumism, we ought to see some evidence of a desire for experience under circumstances similar to those under which relapse to opium occurs. If the peculiar residue of psychic pathology produced by opiumism were specific in character, I should not look for its assuagement by such chemically different drugs as alcohol, cocain or tobacco (the last where the symptoms are mild).

"Any individual may become addicted to the excessive use of narcotic drugs. The majority of my cases represent the average individual with the average heredity and environment. These have generally acquired their habit accidentally. It is, therefore, fallacious and unjust to refer without qualification to drug users as a class inherently neurotic and degenerate."

In amplification to his reply to our question as to the nature of chronic opium intoxication, whether physical or mental, Wholey writes as follows:

"One cannot draw a sharp line of distinction between physical and mental factors in analyzing the basis of addiction to narcotic drugs. The basis, in certain cases, may be regarded as purely physical for a longer or shorter time, depending upon the constitution of the individual, as in *tic douloureux*. But often, in such cases where the circumstances call for the use of the narcotic, it is only a question of time before a pathologic psychic condition is established. In my mind, this constitutes the real basis for the narcotic habit. I believe that normally the appetites and cravings originate largely in visceral activities and are dependent upon the normal functioning of the autonomic system (including the ductless glands) along with that of the viscera; in other words, the James-Lange theory of the emotions enables us to explain the pathology of narcotic addiction more satisfactorily than any other theory. It is because of the pathologic reactions, which are set up in the autonomic visceral system, that abnormal cravings are established. Because of this fact, these cravings are so difficult to eradicate, and produce such a profound impression upon personality equations and character-integrity. This is because the autonomic element is injected into the situation. A condition is precipitated which reduces every individual to a psychopathologic basis comparable to, if not identical with, that of the hysteric. Craving for the drug occurs under conditions similar to those under which symptoms of hysteria arise, in one who shifts to this mode of reaction, where normal adjustment seems impossible. The difference lies in the fact that the narcomaniac seizes upon the drug, and the hysteric retreats behind his protecting symptom. There is a great individual difference in the rapidity with which the foundations of the personality present evidence of giving way to the subtle attacks of the narcotic; one is able to gauge the stability and resistance of a given individual's character and mental makeup, with remarkable accuracy, by checking up the degree of facility with which he succumbs to the pathologic modes of reaction typically set up by the use of the drug. In the inherently unstable, the drug plays quick and generally permanent havoc—showing itself in the fact that these individuals rarely make a successful recovery, after coming definitely under the domination of the drug; few of them are able again to make successful social adaptation. It is the cases who belong to this type who constitute the menace to an understanding of drug addicts generally, and it is this class which is so unsuccessfully and so unintelligently handled. Nothing short of prolonged institutional care, under conditions such as might be had in farm colonies, where they could learn trades or pursue other avocations under protection and discipline, will, as a rule, give them any chance for a successful rehabilitation. A further evidence of the marked involvement of the autonomic system, is furnished in many ways. As an individual comes more and more under the domination of the habit, his desires and cravings and ambitions all become merged into the one big concern of his existence—the procuring of the drug and the maintaining of the narcotic state. The deep-seated inroads made upon his personality is evidenced in his loss of the instinct of self-preservation. He ceases to be provident. Things seem promising when they are not so and reality is entirely colored by the abnormal outlook created by the drug. Among the physical evidences of involvement of the autonomic system we find cessation of menstruation in the female with atrophy of the mammae, and in both sexes, very commonly, a marked interference with, if not a complete loss of, normal sexual feeling. These glandular functions and instincts are under the control of the autonomic system. Among 'withdrawal' symptoms we have very commonly the appearance of such involuntary autonomic phenomena as sneezing and yawning. Further evidence of the autonomic control of the patient is furnished in the instances where even very intelligent and, apparently, well-meaning persons will secretly take the drug throughout their treatment and undergo considerable discomfort, when they cannot help but know that the circumstances will be revealed and their reputation and money lost."

F. Hildebrandt—1922.[86]

The work of this author consists in a study of the changes in metabolism in rats caused by thyroid, thyroidectomy and the chronic administration of morphin. In his study of the effect of chronic morphin administration, experiments were made on eight rats, the details of which he gives as follows:

"Half of these were kept on the same food while the food was varied for the other four, and the experiments were made at least 12 hours after the last feeding. . . . Where we began with a dose of about 10 mg. per 100 g., at the height of immunization 60-100 mg. morphin hydroch. per 100 g. rat was injected daily. Especially in the first eight days of immunization the desire for food was considerably diminished, and the animals often ate scarcely half of their bread and milk ration. Otherwise, when they were once addicted to the morphin, even on high doses, they behaved normally again after 1 to 2 hours. The skin of the back under which the injections were made was dry and brittle and lost the hair in spots.

---

[86] Hildebrandt, F.—Über Veränderungen des Stoffwechsels nach chronischer Morphinzufuhr Arch. f. exper. Path. u. Pharm. 1922. Vol. 92. pp. 68-95.

"First let me report on the experiments on the four rats during immunization in a state of fasting. They were young animals still in the growing stage. On June 18th, the morphin injections were begun. The animals increased up to the beginning of July, when their metabolism was studied in two-hour experiments, about 15-20% in weight, an indication of the fact that their growth was practically uninterrupted by the administration of the morphin."

Morphinization began June 18, 1920

No. of rat	Date of experiment	Weight	In 2 hours			Per kilo and hour	
			O_2	CO_2	R. Q.	O_2	CO_2
	July	*g.*					
1 Rat	2	86	308	314	0.731	2.61	2.60
	13	96	580	674	0.84	3.02	3.51
Last injection on July 14	16	92	582	606	0.753	3.17	3.30
	20	86	579	603	0.753	3.26	3.51
2 Rat	5	86	396	362	0.66	2.31	2.06
	9	90	457	506	0.817	2.49	2.81
3 Rat	6	80	359	363	0.731	2.25	2.27
	10	80	603	679	0.82	3.95	4.28
4 Rat	7	73	317	339	0.774	2.17	2.32
Last injection on July 12	16	67	495	514	0.75	3.7	3.86

The results are given briefly in table form on the preceding page. The author continues:

"In consideration of the results of these and all other experiments we can establish three points:

"1. A reduction of metabolism, which cannot be further explained. There must be taken into consideration the narcotic action of the morphin and a change in the behavior of the animal in the nature of a diminished spontaneous mobility. For both there is known at present no basis, and therefore, as above mentioned, we have always refrained from making an injection on the same day as the experiment was made, in order not to vitiate our results with the acute narcotic action. An after effect on the day following injection could be avoided, as the animals had maintained themselves in the beginning of the morphin administrations after about ten to twelve hours and later even after one to two hours. Our rats appeared perfectly normal on the days for experiment and no different in their behavior from addicted animals. During morphinisation the weight remained the same for a long time, in many (young, growing rats) it continued so, in a few grown animals there was a slight decrease.

"2. In the final states of the morphinisation—in general after about four weeks—there appeared suddenly a rapid loss in weight, the rats were cachectic and at the same time the metabolism rose considerably beyond normal.

"3. Both actions show that the chronic administration of morphin interferes in some way with the mechanism of metabolism. This is true also of the observations on the respiratory quotient. In comparison to the normal it is greatly increased. Therefore the same point may be established as in the case of the thyroidectomised animals. Here also the same question arises: primary increase of the consumption of carbohydrates, interrupted glycogen formation, or increased mobilization of glycogen. As a further possibility for discussion there is an increased CO_2 elimination (as the result of a CO_2 retention through the narcotic action of the morphin) on the day following the injection. If we consider this last possibility first, it does not seem necessary to explain the high respiratory quotient. If this is right, we should expect especially in the first part of the morphin addiction, i.e. after the first injection, an especially high respiratory quotient, since the recovery from the acute morphin poisoning always proceeds quickly with the degree of addiction, with which there is always associated a short CO_2 retention. But as a matter of fact the opposite is the case: the further morphinisation advances, the higher the respiratory quotient.

"What is the case then with the interrupted glycogen fixation and the increased mobilization of the glycogen? If again we proceed from the hypothesis that the sugar is not fit for consumption in the organism when it does not originate in glycogen, then there can be no interruption of the glycogen fixation for the respiratory quotient may not be high, since the carbohydrates offered to the organism can be consumed only with difficulty. The possibility of an increased mobilization appears very plausible, as glycosuria is often observed after morphin. But on further reflection this hypothesis is also untenable: from the experiments of Luzzato on dogs and rabbits it has been found that in the first place very toxic doses of morphin must be used in order to produce a glycosuria, from which there is obtained at the same time a considerable amount of albumen. Further there is involved only a transitory phenomenon which disappears with the cessation of the morphin action, and in the third place the important thing for us is that we succeed in completely preventing the appearance of glycosuria by cautious addiction to morphin. As pointed out above, we made no injections on the days of experiments. That the morphin would still cause sugar mobilization on the day following the injection is highly improbable and according to Luzzato's experiments can be disregarded. Besides we always began the immunization with small doses and in this regard observed no glycosuria, which again is in accord with Luzzato's experiments. Consequently it would be inconsistent to account for the high respiratory quotient by increased sugar mobilization. Rather we should accept the hypothesis that it is a question of a primary increase in the consumption of the carbohydrates."

In relation to the similarity between the chronic administration of morphin and thyroidectomy, the author states:

"If we compare the action of the chronic administration of morphin with that of thyroid feeding and thyroidectomy, we find that the treatment with morphin over a long period has the same effect on the metabolism of the rats as the removal of the thyroid gland. In both cases there is a reduction of the metabolism which in both cases we can attribute with apparent certainty to a primary increase in the oxidation of the carbohydrates.

"Then the question was—do thyroidectomy and long-continued morphin administration act similarly in other respects?

"We have mentioned above experiments on thyroidectomized rats in which the high respiratory quotient was lowered by thyroid feeding and the total metabolism was raised. If then we succeeded in obtaining this also in morphinized animals by supplying thyroid, we could draw a further analogy. As a matter of fact this was the case:

"The respiratory quotient of the rat concerned was on the 12th day of morphin administration on the five observation hours 1.04, 0.984, 0.98, 0.87 and 0.80. With the same daily dose of morphin injected, 2 g. thyroid daily was fed for three days. On the fourth day the course of the respiratory quotient was considerably lowered—0.904, 0.803 and 0.758 in the first three observation hours. In spite of the great loss in weight (22 g. in four days since the beginning of the thyroid feeding) the total metabolism also increased. In each of three hours before the administration of the morphin 880 mg. 0_2, on the twelfth day of morphinization 779 mg., after three days' thyroid feeding plus morphin 813. mg. On the basis of per kilo and hour the result on 22 g. loss in weight would naturally be considerably greater."

Hildebrandt also studied the sensitiveness of rats chronically treated with morphin to 0_2 deficiency, which he describes as follows:

"From the experiments of the Asher school, it was found that thyroid-fed rats showed a greatly increased sensitiveness to 0_2 deficiency, those without thyroid glands, on the other hand, bore the 0_2 deficiency comparatively well. If rats chronically treated with morphin behave as thyroidectomized animals, then a further support is obtained. The order of experiments was the same as that used by Rippstein. Two rats—one thyroidectomized or treated with morphin and one normal—were placed under a bell-jar and the air slowly was exhausted. In order to eliminate a subjective error one of the animals was always identified by a piece of ribbon; judgment as to symptoms was left to neutral observers who did not know what the ribbon signified. The findings of Asher were completely confirmed. The thyroid-fed animals died on merely one pressure while the normal showed comparatively light symptoms. On the other hand the thyroidectomized animals differed considerably from the normal. The final state on a pressure of 350 to 300 mm. Hg. was uniformly characteristic. On higher pressures during the first five minutes of the experiment the behavior of the animals often varied. More often they sat there apparently exhausted only shortly to run around again in lively manner trying to escape. On the other hand in the lower pressures the difference between the normal and thyroidectomized or morphinized animals was not noticeable.

"The following brief protocol serves as an illustration:

July 1 morphin rat weight 143 g. On June 18 immunization began. Daily injections of 80 mg. No injection on the day of observation.	Pressure	Normal rat weight 160 g.
Dyspnoea	450	Dyspnoea
Dyspnoea—sits in normal position	380	Very strong dyspnoea Lies flat on its stomach
	330	Ataxic
Spontaneous stimulation still	305	Labored breathing, moribund
No ataxia	Pressure to normal	
Complete recovery		Spasms then gradual recovery

"Two further experiments on morphinized and normal rats had the same results.

"In relation to their sensitiveness to 0_2 deficiency therefore the rats treated chronically with morphin and the thyroidectomized rats behaved similarly."

Hildebrandt concludes as follows:

"A series of analogies have been obtained as to metabolism of thyroidectomized rats and rats treated chronically with morphin:—a decrease in the metabolism, higher respiratory quotient which in both cases could be explained with greater probability by a primary increase in the absorption of carbohydrates, a further decrease in the high respiratory quotient upon thyroid feeding and less sensitiveness toward 0_2 deficiency.

"Evidently the same mechanism is involved. But as long as we do not know in what way individually the thyroid gland and thyroid deficiency affect the metabolism we cannot say how the parallelism operates.

"Whether there is a further similarity between the effect of thyroid deficiency and that of chronic morphin supply or whether we may assume that the action of the morphin influences metabolism in spite of the thyroid—in a sense a restraining of its function—remains to be seen."

F. A. Loofs—1922.[87]

"Since it has been proved through the different investigations (Cloetta *et al.*) that it is not a question of immunity in the sense of Ehrlich's side-chain theory, the question naturally arises: *What chemical constituent of the cell has the*

---

[87] Loofs, F. A.—Über die Möglichkeit einer klinisch-chemischen Kontrolle des Morphinismus. Bemerkungen zur Theorie der Morphin-gewöhnung. Ztschr. f. d. g. Neurol. u. Psychiat. 1922. Vol. 79. pp. 433-462.

ability to bind the morphin through an affinity of the molecule for alkaloids and other similar bodies? Then the toxicity could be explained by the binding of the morphin, if it takes place within the cell, the disappearance of the toxicity (and also the morphin disturbance) could be explained by the breaking away of this substance attached to the morphin from the cell and the protective effect by the distribution of this substance in the blood before the effect on the sensitive cells. An increased protective effect in addiction could then be explained by the increased appearance of this substance naturally 'related' to the morphin.

"*Such a cell constituent actually exists. This is lecithin. Lecithin contains in the molecule a base which is closely related to the alkaloids and is relatively easily split up, cholin.* On the basis of the fact that in the breaking-down process in the brain, especially in epilepsy, cholin appears in the medulla oblongata fluid (according to Hoppe-Seyler, 8th edition, page 204) and on the basis of the general conception of the cell metabolism, we must assume that the lecithin molecule is in a state of alternating formation and breaking up of the cholin; that therefore there is a certain lability in the connection between distearylglycerinphosphorous acid portion on the one hand and the cholin on the other. The morphin molecule can appear in this labile state and according to the degree of its affinity replace the cholin. Chemically, as my Herr Geheimrat Paal confirmed in personal discussion, there is sufficient probability for this statement. Cholin and morphin are both basic alcohols. A decision as to this possibility could be brought about only from experiment. I have undertaken investigations along these lines."

* * * * *

"A further support for this hypothesis may be found in the fact that *a large part of the withdrawal phenomena may be explained by the inundation of the organism with cholin crowded out from its natural relationships,* and a further portion of the symptom-complex may be explained by the impoverishment of the cell in lecithin according to which we can easily understand the characteristic loss of general tonus. Cholin, toxic in large amounts, pharmacologically belongs to the muscarin group. A pseudomuscarin is formed from the cholin. It is further closely related to the far more poisonous neurin which is repeatedly detected in metabolism as a splitting-off product of cholin. The toxic effects of cholin are as follows: salivation, stimulation of the sympathetic (vascular disturbances); further, stimulation of the intestinal vagus (diarrhea, vomiting, meteorism); and above all motor *stimulation.* In addition there is a specific affinity of the cholin for the outer skin which plays such an important rôle in the withdrawal toxicosis of morphinism (Ellinger, Münch. med. Wochenschr. 1914. p. 2336).

"On the basis of this hypothesis the picture of morphin addiction may be described as follows: The morphin which is administered for the first time is taken up in the lecithin molecule according to its affinity quota (cholin/morphin in proportion to the distearylglycerinphosphorous acid). This causes at first a disturbance in the cell equilibrium and pharmacologic action. The cell equilibrium is again obtained by the throwing off of the displaced cholin. If nothing more than this single dose is administered very soon the morphin is eliminated by the appearance of a fresh supply of the cholin (with or without alteration of the molecule). If in the meantime the discomfort appearing with the disturbed cell equilibrium leads to renewed administration of morphin, then a new part of the lecithin molecule is taken up with morphin instead of cholin. *Since one part of the molecule is taken up with morphin, the possibility of a pharmacologic action of the morphin is thus lessened. This diminishing of the possible action increases with each time and is the origin of the addiction. The limit of the possible action is the complete taking up of the distearylglycerinphosphorous acid radical with morphin corresponding to the affinity quota. This is the point at which even the increased amount of administered morphin produces no further effect.* Rehabilitation in withdrawal follows upon the gradual replacement of the morphin by 'normal' cholin. If this does not follow (lack of the supply of cholin), and if there is no supply of morphin due to withdrawal then there probably takes place continued breaking-up of the lecithin molecule. Corresponding to this the stage of acute withdrawal symptoms (the first 48 hours) may be considered as cholin poisoning and the second stage as severe cell injury through the breaking-up of the lecithin molecule. In the first stage the symptoms of a poisoning prevail, in the second stage those of a severe atony (loss of cell tonus due to lack of lecithin).

"On the basis of this hypothesis we should expect to obtain the following findings:

"1. Increase of cholin in the blood and in the excreta during morphin addiction. This is true especially in the first two days of withdrawal.

"2. Increase of glycerinphosphorous acid in the blood and the excreta in the second chronic stage of withdrawal.

"3. Therapeutic action of measurable cholin doses in the second stage of withdrawal.

"4. Pharmacologic inactivity of the distearylglycerinphosphorous acid ester of morphin.

"5. Determination of substitution products of morphin, which result from the binding of the morphin with parts of the lecithin molecule during addiction to morphin. Such a binding explains the attenuation of the toxicity of the morphin getting into the excreta and on the other hand its absence in the usual morphin test.

"It is quite conceivable that my investigation now in progress will lead to entirely different results. There is, however, no reason for not advancing beforehand a plausible working hypothesis. The Ehrlich side-chain theory for the most part has failed. The Wassermann reaction, however, is still at hand. It would be rather egotistical too for me to settle these ideas before experimental demonstration. For my part I am convinced that indications point in this or a similar direction and I should like to make sure of priority, especially as there is a long distance between the idea and proof."

Ernst Joël—1923.[88]

The author approaches his subject from the general biologic angle of adaptation of the organism which he says is an active transformation of the original condition in response to stimuli. Such an adaptation to repeated stimuli differs essentially from regulation or reaction of a temporary character. A morphological example is that of cardiac hyperplasia resulting from the repeated demands of physical exercise in contradistinction to the acceleration of the pulse and raised blood-pressure—regulation—resulting from an occasional demand on the organ. Such muscular adaptation—hypertrophy—always involves the repeated application of an unaccustomed stimulus. The same is true with functional adaptation where "each separate stimulus, whether it be food, a hormone, or a toxin, is answered by a reaction, whose general purpose is to restore the body, after a few undulations, to that uniformity in carrying on its manifold activities which seems to be an indispensable biological condition." From such stimulus and reaction the organism emerges in its normal state, but with unusual, injurious, or especially unphysiologic stimuli a qualitative or quantitative reaction of a different sort may be induced,—an acquired condition which we call addiction. Here the stimulative action takes the form of a limited injury to the organism or to some organ, in a narrow sense an analogue of morphologic adaptation. Examples of this are adaptation to temperature, rays of light, degrees of humidity, dietary changes, etc. and prolonged addiction results in hardening, acclimatization, etc., etc.

The author carries the idea further as follows:

> "When there is a continual, unwonted stimulation from a chemical source, therefore from a poison, gradually, if there exists a possibility of efficiency in the single stimuli, which generally are less hurtful, an increased tolerance comes about,—a relative acquired resistance to the poison.
>
> "This ability to resist the poison may be gained in numerous ways, by diminishing the sensitiveness and so dulling it—a doubtful idea so long as we are ignorant of its mechanism; or by detoxicating the body, whether the poison be rendered ineffective through removal, through incarceration, or through combination, whether it be rapidly removed by intensive elimination, or less of it admitted to the circulation, in case of oral administration, by reason of restricted absorption."

* * * * *

---

[88] Joël, Ernst—Zur Pathologie der Gewöhnung. Therap. Gegenwart. 1923. Vol. 64. p. 397-403; 441-447.

"If, in the course of clinical or experimental observation, the excretion of the poison diminishes in proportion to a constant increase in tolerance, the suspicion is aroused that it has been decomposed or transformed in the body, but this is not certain—it might always be brought about by diminished sensitiveness—so long as the blood and tissues have not been actually proved free from poison.

"If the amount of poison excreted in a given time increases along with increasing tolerance, there is less reason to think of decomposition or hyposensitiveness as the cause of tolerance, but of accelerated elimination rather or constantly diminished absorption, depending on whether the urinary or the fecal contingent increased during oral administration."

As an illustration the author refers to Cloetta's work on addiction of animals to arsenic, in which it was shown that there was a "local, intestinal immunity dependent on refusal to absorb."

The author continues:

"The mechanism of addiction is often found to be quite complicated. Frequently no satisfactory balance exists between intake, outgo, and residue in the body, and, as a criterion as to whether increasing hyposensitiveness is the cause of addiction, the question often arises whether the amount of poison in the body circulates without being active or whether the poison is active so long as it remains in the body.

"It was a remarkable advance when Faust showed that dogs, which soon were without the initial symptoms through receiving a daily subcutaneous injection of about two centigrams of morphin per kilogram, causing at first an amount of sixty per cent of the drug to be excreted in the feces, decreased gradually to an amount constantly smaller and then ceased entirely. At that time the organs contained no morphin, so that Faust conjectured intravital destruction. This possible destruction did not appear to later investigators an altogether satisfactory condition of addiction. In the first place it appeared that sufficient amounts of a well-dissolved poison might circulate without causing symptoms of a toxic character (Rübsamen); so then addiction to a poison need not be universal. A dog successfully addicted to large doses of morphin, who responded to twenty-three centigrams per kilogram without narcosis or vomiting or glycosuria (Luzzatto), once more acquired bradycardia on one milligram per kilogram, just before addiction. Thus the vagus centre constitutes a very delicate indicator for the circulation of effective amounts (Egmond). In this the succession in which the various centres and organs of the dog fall under addiction to morphin does not correspond precisely with that in unaccustomed animals (van Dongen). We find it quite the same in the case of heroin, whose spastic properties still remain irritant to dogs in spite of long addiction and of decomposition of a large share of the poison (Langer). According to Gunn and Heathcote the lethal dose of strophanthin for rats is thirty times as large as for rabbits, but the erythrocytes of both animals yield in the same way to strophanthin hemolysis. During strophanthin addiction cats manifest no sort of correspondence between the symptoms in the nervous system and those of the circulatory apparatus (Klein).

"All these instances teach us two things. First: although pronounced addiction may have taken place, any portion whatever of the organism may remain unaffected, may still react, may show sensitiveness. There exists, therefore, a specific response to addiction in the system, in the organ, in function. And in the second place: while, as in the vagus centres of morphin addicted dogs, there still remain tracts that are sensitive. These indications furnish pharmacological evidence that in these instances not decomposition of the poison, or at least not decomposition alone, lies at the root of addiction, but beside that, its ineffectiveness.

"Let us consider these two phenomena from the standpoint of clinical experience.

"Should the decomposition of the poison prove to have been effected in addiction to the fullest extent, the large amounts of morphin required by the addict would work an injury rather to his economy than to his health. He must simply expect a certain percentage of morphin to be decomposed at once and so to have no effect on him, and must take more at the beginning by way of compensation. But experience teaches something more, namely the effectiveness of small doses even in confirmed addicts, but—and this is decisive—these doses have a brief duration of effect.

> "In a morphin addict briefly observed by me it was very impressive to see that, when during a few hours' intercourse his speech every now and then grew weak and his bodily strength failed visibly, doses of one or two centigrams stimulated him again for an hour or so. So this amount of poison is exhausted sooner than normally, but it is still effective in the customary dosage.

"The second fact, that of selective, dissociated addiction, of the increased tolerance of special organs, is calculated to serve as a connecting link between addiction and chronic poisoning.

"If mankind were universally addicted to a poison—in which event it would be perpetual—that would be a very remarkable, but a purely biological phenomenon without specifically medical interest. The medical interest lies in the fact of the man accustomed to a poison becoming sick. He is sick because the poison taken habitually, while it fixes certain cells and confers on them increased activity or passivity, also renders these or other cells unserviceable for other functions, non-resistant to other influences. The drunkard dies of cerebral alcohol poisoning no more readily than the unaccustomed man who takes the same amount, but he dies in his liver, which has become diseased in the service of other organs.

"His brain has become addicted, but not his liver. The morphinist has acquired a high tolerance in certain regions of the brain, but his cortical cells have not shared in the poison to such an extent that they have preserved their energy undiminished.

"Thus addiction is not clinically universal, but specific, restricted to certain organs or cells or merely to certain cell activities. Adaptation to an unphysiological stimulus is pathological, addiction is the disease. The unaccustomed man who reacts by an acute illness to the drinking of a quart of beer thereby demonstrates his possession of pristine health. The habitual drinker, who remains free from morbid symptoms on enormous amounts, thereby advertises his ill-health.

"Here arises a kindred question, namely, whether bodies immunized by having overcome infection and which likewise react to a disease differently from those unaffected, are therefore less healthy than these. The answer to this question depends, generally speaking, on how we define health in the narrow sense, whether and with how permanent injury the acquisition of immunity was attended.

"If addiction is affected by the poison chiefly in special organs, this resistance, when it consists in blunting, is not strong in relation to poison encountered. The alcoholic is not alone fortified against alcohol, the morphin addict against morphin.

> "One of my patients, who was notably excited during morphin withdrawal and wanted to leave the institution, toward evening received eighty centigrams of luminal together with half a milligram of scopolamin. When I visited him two hours later he had arisen in order to urge upon me the impossibility of his remaining longer.

"The great susceptibility of the alcoholic to narcotization is a frequent experience and, since the brain consumes much of the narcotic and the heart tolerates little, illustrates excellently the fact of selective addiction. . . . ."

After discussing addiction to nicotin and alcohol as evidenced by clinical observations and studies on animals, the author continues:

"If it is true that the tolerance arising from blunting of organic activity is not strongly specific for the poison tolerated, but that the increased tolerance is that which arises from chemical changes in the poison in the body, we can understand how this implies a special structure in the poison, a special atomic group as its object.

"So then the phenylhydroxyl group in the case of morphin is the object of the decomposition which we must regard as an accompaniment of addiction. Retention in a methyl group, as in codein, or in an ethyl group, as in dionin, interferes with decomposition and addiction (Bouma), with the latter naturally only so far as it depends on decomposition. But in case the phenylhydroxyl and alcohol-hydroxyl are acetylized, so that diacetylmorphin (heroin) is formed, it is well understood that the acetyl group is very easily broken up, allowing the effect of morphin to take place. And thus—the point of real importance—the body learns to break up this acetyl group, while with a single dose the greater part of the heroin appears unchanged in the urine, a smaller part in the feces (Langer). Babel showed that the organic substance of animals addicted to morphin is capable of decomposing heroin to a given extent, but not codein—an extension of Bouma's result. Double hydration of morphin to paracodin has a similar effect to acetylization. The product does not clinically cause codeinism. (A. Fränkel) nor dioninism (Scherer), but, and this in animal experiments too, heroinism, paracodinism, eucodalism, dicodinism (König, Alexander, Biberfield, Hecht).

"It may be remarked as a corollary that the spastic poison, harmalin (from wild rue), seems to possess a very similar mechanical action in addiction to that of morphin (Flury), a fact the more noticeable because addiction to spastic poisons in the narrow sense is met much less frequently than that to narcotics, where, as, for instance, in the case of papaverin, addiction through increasing decomposition of the alkaloid is nothing unusual (Zahn).

"Regarding the location where morphin is broken down little is known. It is assured that the liver takes a foremost part here. This being so, several points of connection are revealed between addiction and the manner of application. Quite rightly those who take morphin by mouth generally are considered to offer a better prognosis than those who use it by injection."

The author then reviews the work of a number of investigators on addiction to quinin, atropin, phenylhydrazin, and pyrodin. Continuing he says:

"The proper estimation, not only of the mechanism, but of the actual state of addiction is a complicated matter when it involves the poisons of human indulgence, those which cause marked increase of pleasure and chiefly affect the nervous system, although arsenism in human beings and less frequently digitalism are included (Balz, Schubert). (Corresponding reports of animal experiments by Cloetta and Klein).

"As an example of the abuse of cocain in gratification, the difficulties may especially be illustrated which stand in the way of interpreting the central nervous effects of the poison, and so certain general points of observation may be won. The assertion frequently made of human addiction to cocain appears to depend upon confusion of the readily distinguishable conceptions of pharmacological tolerance and of psychic accustoming or passionate addiction. But recognition of this psychological condition does not furnish proof of actually acquired relative tolerance for the poison. As shown by experiments carried on together with Fränkel, even the large doses of cocain addicts and their attainment by gradual increase are not alone sufficient to explain this, for idiosyncrasy in many persons tallies with remarkable natural tolerance in others, and the increased use is explainable as a gradual stumbling onward, an increasing confidence in the poison and an augmenting inclination to reproduce its effect. Clinical tolerance should not be spoken of except where the statement specifically accompanies it that the initial dose had become incapable after a period of producing the cocain effect, that its effective period had perceptibly diminished—statements which have never been made to us. The fact is important in the light of these remarks that the cocain user, after a voluntary or compulsory interval of six or eight months without cocain, can resume without harm the same dose at which he discontinued before the hiatus. In morphinists, who begin anew so to speak on every reversion, this is inconceivable. In their case abstinence is sufficient, even a reduction for some days or a few weeks suffices to restore in large measure their sensitiveness to the poison; we have often even received the impression that the morphin addict, before returning to normal sensitiveness toward his poison, must pass through a stage of hypersensitiveness, a question which may perhaps find a clearer answer in animal experiments, because in human beings psychic influences always interfere.

"With the cocain addict it is different. After an intermission he must return to his large dose, a circumstance that stands in complete agreement with the results of animal experiments, where likewise no sort of addiction is produced, but frequently a sensitization (Ehrlich, Grode, Levy).

"A number of facts point directly to the absence of true tolerance. Together with Frantz I have studied the bodily phenomena after injection under uniform conditions of five centigrams of cocain into a large number of normal individuals and of cocain users, and thus have found that less can be said of general sensitiveness and insensitiveness to cocain in individuals than of a sensitiveness occasionally prevailing in certain organs or organic systems, and that cocain users complain, just as normal subjects do, sometimes of tachycardia in particular, sometimes of high blood-pressure, sometimes of tachypnea, tremor, and so on. The possible objection that in cocain users the phenomena of addiction belong less in the somatic field than in the psychic I might refute with Fränkel by saying that cocain users who have devoted themselves passionately to the drug for years have sometimes been known to react to small, by no means, large doses of a pure preparation with the severest hallucinatory excitation, just as an unaccustomed person when poisoned medicinally necessarily undergoes the same psychic alterations.

"Although, therefore, in contrast with morphin, we consider a tolerance to cocain in the pharmacological sense as unproved, we are compelled to recognize explicitly the fact of a passionate addiction, which is often seen, and this leads us to a short discussion of the relations existing between psychic addiction and pharmacological tolerance. The foundation of abuse of a poison almost always produces either a physical or a psychic defect. In the former case the poison signifies, as for morphin, relief of pain, or as for heroin, cessation of dyspnea. The psychic defect is the same, and is felt as a torturing insufficiency and compensation sought in the habitual use of a poison in the endeavor to complete the personality by means of that poison. An accidental acquaintance with a pleasurable poison—sometimes on occasion of a war wound, a gallstone attack, an attack of hay fever—leads to subjection and permanent addiction. In the case of other toxicomaniacs the anamnesis can be traced as, without any physical determinant from without, they have tried the abuse of a poison and been pursued by it, and so have gone on from nicotin to alcohol, to morphin, to cocain, to heroin. When the habit of indulgence in a poison has fastened on an individual so that he has become a pharmacological addict in the sense above-defined, the situation becomes complicated for him as a toxicomaniac in that the poison which physical conditions compel him to use constantly becomes less effective, his dose must be increased, the danger of poisoning continually is augmented, but to discard the poison adds to the initial psychical symptoms of craving those of abstinence, which arises legitimately from abuse of the poison itself.

"Very certainly it is the symptoms of abstinence which characterize addiction, at least in every instance where the body cells have opportunity to react to the poison. (In case of arsenic, where addiction takes the form of progressive diminution of absorption, the deficiency symptoms do not appear.) That the addict tolerates ten or a hundred times his initial dose is therefore only one feature of addiction; that he requires it reduces to a very small value what at first was regarded as an acquisition, even marks addiction as pathological and distinguishes it from the natural immunity to poison. The severity of the symptoms of abstinence appears to be the converse of the degree of addiction and of the pleasure received from the poison. One of our morphin addicts wrote in his personal report:—'at the close of these two years the withdrawal treatment has accumulated and repaid in horror all that it has afforded of euphoria.' The resultant manifestations will be more or less characteristic according to the special effects of the drug. Addiction to veronal, for instance, will be followed by pertinacious insomnia, addiction to morphin, which, especially in neuropaths, has an indirect tonic effect from excluding inhibitions, by stimulating nearly all the outward vital activities, in case of heroin going so far as symptoms of abstinence in opposition to its principal effect, especially in dyspnea (Manguat, Duhem).

"Suppression of administration, therefore, acts like a powerful specific poison, withdrawal, as Kobert says, resembles an intoxication. The symptoms of abstinence certainly justify the popular expression of the 'second nature' of an addict, and call for recognition of the state of addiction as the establishment of a new equipoise.

"In discussing the concept and the diagnosis of the phenomena of abstinence, it should be said here that naturally it is an error to regard every complaint appearing during the period of poison hunger as a symptom of disease. In the first place, desire for the production of a euphoric state of mind is as far from being an abstinence symptom as is the wish for any other gratification formerly experienced. Thus the direct effects of the last dose of poison are to be left out of consideration, if, for instance, gastric disturbance following acute alcohol poisoning is not to be regarded as other than a symptom of abstinence. The same holds true for all forms of physical manifestation of chronic poisoning which appear unconcealed and unchecked during abstinence. Abstinence has to do with the perception of these manifestations, but is not their cause. Finally, the *status quo ante* must always be taken account of. When an asthenic person is tonically improved by use of arsenic, the annoyances attending discontinuance of the arsenic are not abstinence symptoms, but merely the return of the former condition after using the drug. This holds still more true for the cerebral poisons in psychasthenics, for instance in cocain users.

"The participation of psychic influences in addiction and withdrawal is sometimes overestimated from the medical standpoint, when, for instance, substitute injections are given in place of morphin. The direct quieting effect of such mystification is self-explanatory. Nevertheless only such morphin addicts can be misled longer than a few minutes as are beginners, dilletanti they might be called, in their poison. The true toxicomaniac quickly notes the fraud, but—and this is the point—not because his mental capacity is so great, but because the body cells concerned have acquired such a preeminent power of discrimination, as is proved by a reversal of the procedure.

"The morphin addict, Z., who was suffering intensely on the second day of withdrawal, received two centigrams of morphin under the pretence that it was an injection of another kind. He continued to complain, begged for an injection of morphin, and soon fell asleep lamenting constantly that his morphin should be given him.

"Here let me say a few words about withdrawal. Strictly speaking, withdrawal is disuse where an actual condition of addiction has preceded. Biologically considered, the problem necessarily consists in restoring sensitiveness for the poison in question. It may be asked whether return of sensitiveness could be promoted by special measures, by changes in the organism, by production perhaps of non-specific stimulation. The possibility of such reactionary changes is shown by the studies of Freund and Gottlieb. Biberfeld produced brief interruptions of morphin addiction in dogs by blood-letting and parenteral protein injections. From the clinical aspect Beringer reports withdrawal of morphin as abridged and facilitated by oral administration of protein. It might seem to us as though the essential factor of withdrawal is that of time, and that during this period the patient stands most in need of psychic treatment. The question of rapid or gradual withdrawal cannot be determined in advance by rule. An important factor must be given foremost consideration in settling it, concerning which Levinstein, the originator of the rapid form of treatment, argues that in the gradual process the finally successful withdrawal of the last doses causes but few less symptoms than cutting off the entire dose by a sudden withdrawal. Experiments with a view to bringing about abandonment by means of specific antisera have all proved disappointing. In this field there is a radical difference between substances without and with the character of antigens (Lewin, Morgenroth).

"All phenomena of adaptation ought occasionally and if only by way of imagination to be viewed from the standpoint of teleology. We may ask whether the phenomena of addiction discussed here have anything to do with design, when by design we understand the total of the forces directed to the preservation and the ordered conduct of life. We see at once that this biological view of design does not harmonize with a strictly clinical one. It is undoubtedly clinically unintentional when a soporific, a laxative, a febrifuge, or whatever may be no longer proved effective in the original dose: but all these remedies are poisons to the organism as a whole and it stands on the defensive against them. The body misunderstands our therapeutic aim, if it may be so expressed, and in many cases circumvents it by rendering such increased dosage necessary because of partial detoxication or hyposensitiveness as is no longer practicable on account of the toxic effects. The general purpose of life is plainly directed in this respect to the object of maintaining health, even though it be by destructive means. Here another and compensatory principle may at any time enter, the principle of selective distribution of drugs, according to which the cells, which Virchow has shown discharge normally the function of autonomous nutrition, in disease possess themselves of the greater part of the medicament, a process characterized by Jacoby as a new basal law of pharmacology. Jacoby instances the fact that in joint disease a quantity of salicylic acid goes to the joints which in health would flow to the central nervous system. 'So the sick are less subject to poisoning than normal individuals.' Protection against poisoning by means of pathologically altered organotropy is manifest once more in the well-known fact that hypnotics are tolerated by patients in states of agitation in far larger amounts than normal.

In animal experiments Gensler found larger amounts of the hypnotic, neuronal, in the brain in artificially produced states of excitation than in the controls. The state of agitation is therefore to be regarded as functionally the antagonist of the hypnotic, and through it—the reverse of the above instance—the brain is able to guard the other organs against poisoning. It is possible at any rate that the fact, not studied systematically, but frequently observed empirically, of tolerance raised *in advance* on the part of many patients to 'their' drugs (arsenic, for instance, in anemia, chorea, pemphigus), is connected with such pathological selection as to paralyze, at least partially, those consequences of addiction which are unfavorable to therapy."

O. Wuth—1923.[89]

From clinical observations and experimental studies, Wuth developed an hypothesis as to the origin of the withdrawal symptoms. He was impressed with the similarity between the symptoms of morphinism and those of hypothyroidism and the symptoms of morphin withdrawal and those of hyperthyroidism and states that "in morphinism it is a question primarily of disturbances in the vegetative nervous system in addiction and withdrawal, of such a kind that in addiction the parasympathetic tonus seems to be increased and in withdrawal the sympathetic."

The author further concludes that the thyroid gland plays an important rôle in the pathology of morphinism and that the action on this gland seems to be produced through the central nervous system. After covering the symptoms during addiction and withdrawal the author continues as follows:

"If first we consider these symptoms we are impressed at once with the fact that in general they are conditioned by a tonus variation of the vegetative nervous system. A second evident point is the similarity between certain of these symptoms and those in conditions where the thyroid gland had been disturbed. A number of symptoms of addiction show a similarity to those in hypothyroidism while many of the phenomena in withdrawal offer a striking similarity to the symptoms in thyrotoxic diseases. Thus there is the dryness of the pale, cold skin; the trophic disturbance of the hair, teeth and nails, constipation, impotence, slow heart action, lower blood pressure, and in many respects the variations in the psychical behavior—all symptoms which we observe also in hypothyroidism. Still more suggestive are the symptoms of the withdrawal period to those of the picture in thyrotoxic conditions; here as there we may observe the warm skin with profuse perspiration, dilated pupils, diarrhoea, palpitation of the heart, tremors and psychomotor stimulation.* A few of the more unusual symptoms appearing during withdrawal as well as in hyperthyroidism are: hemorrhage of the mucous membrane, disturbance of accommodation, double vision, disturbance in walking, muscular pains, pains in the joints, albuminuria, glycosuria, increase in temperature ("Intermittens der morphinsucht," Levinstein).

---

[89] Wuth, O.—Ueber Morphinismus. I. Die Entstehung der Krankheitserscheinungen. Munch. med. Wchnsch. Oct. 12, 1923. V. 70, N. 41. pp. 1266-68.

"Therefore obviously we are concerned with vegetative neurotic disturbances which show a certain similarity to disturbances which may be attributable to hyper- or hypothyroidism. We must now, according to the facts, determine what supports this purely clinically observed hypothesis in respect to the roles played by the vegetative nervous system and the system of blood glands in the pathology of morphinism.

"First as to the pharmacodynamic action of morphin we may see that there is a central hypalgetic effect, that it influences the cerebral cortex, the cough and respiratory centers, the swallowing and vomiting centers and the vasomotor and heat regulating centers. Of the further known effects of morphin there is the contraction of the pupils, the slowing of the heart action, the bladder spasms as a result of the increased tonus of the vagus. Also the increased secretion of the gastric juices after the administration of the morphin causes a stimulation of the vagus as it is checked by atropin. The sympathetic salivation is checked by morphin. Therefore in general morphin acts as a parasympathetic stimulation, and a sympathetic check, but still there are exceptions. Morphin lessens the excitability of the vagus terminating in the intestine and increases the spinal tonus of the nervus splanchnicus. It cannot be asserted that morphin acts electively on the sympathetic or parasympathetic system. At least we may with apparent justification draw upon the results of pharmacologic investigation as to the facts that morphin has a definite effect upon the vegetative nervous system and that in general the action stimulates the parasympathetic and checks the sympathetic without meantime falling into the old error of the antithesis of the pharmacologic susceptibility of both of these systems. We should not omit reference to the fact that it is a question not only of pharmacologic analysis but also of investigation on the subject of addiction. For example it is known that the secretion of gastric juice is increased on the administration of morphin, it is checked on the chronic abuse of morphin and in the withdrawal period it is again increased. Further it should be noted that in all patients we do not find the above described symptoms by any means. Also in the withdrawal period unusual individual differences may be noted. Just as different kinds of animals so also individuals show entirely different behavior toward morphin; in many the morphin has only a stimulating action. It would be interesting to investigate the question as to whether or not this different behavior is conditioned perhaps by the whole vegetative-endocrine organization."

The author then reviews certain experimental work dealing with the interrelationship of thryroid action and morphin effect, quoting the work of Hunt, Gottlieb, Hildebrandt, Boeck, and also the work of Guber and Valenti, which he states point to the fact that the thyroid gland plays an important part in the pathology of morphinism. He continues:

---

* Incidentally it may be noted that most of the Basedow psychoses show stimulation.

> "Still the question may arise as to whether we should consider the action on the thyroid as a direct one or whether there is an influence on the vegetative centers. The question is extremely difficult and can be decided from a purely clinical-empirical basis. The pharmacologic effects as they are so far known of morphinism (effect on the cough and respiratory center, swallowing and vomiting centers, vasomotor and heat regulating centers, reduction of oxidation, Leake) indicate a central action. The significance of the thyrotoxic and sympatheticotonic symptoms, insofar as the related experiments are not contrary to this conception may be applicable here only to the neurogenic, post-traumatic Basedow, to diabetes insipidus after central organ sickness, to fear hyperglykemia and especially to the central nervous sensitiveness of the function of the thyroid with internal secretion. If we follow the above hypothesis we have to consider morphinism somewhat as follows: For physical, psychical or vegetative neurotic disturbances a dose of morphin is administered. The morphin has a numbing effect on the function of the thyroid and the related nerves and humoral organs (sympathetic, adrenal system). If the organism shows a tendency to recover again its endocrine vegetative balance it compensates. Accordingly it became necessary, in order to obtain the same action on repeated administration, i.e., to return the vegetative endocrine tonus again to the most desirable level, to reduce the tonus increase produced by the effort of the organism to balance itself. In other words—a larger dose of morphin is necessary to produce the same action. This condition forms one of the factors of addiction. Another may be found in the relatively reduced effect of the poison. From this we may recall the above experimentally determined fact that in thyroid deficient animals there is a lessened sensitiveness toward morphin and since the function of the thyroid is reduced in a certain sense by the administration of morphin, the sensitiveness to the poison is also reduced. If we proceed thus to a plausible explanation of a few of the important factors of the disease, of the 'morphin hunger' and of addiction, we may be able to explain a series of clinical facts on the basis of this hypothesis. Among the early ones it is known that morphin, as Levinstein says, produces the same symptoms which it also attacks. And perhaps here we have one of the principal factors for the disease. We know that strict psychopaths complain of numerous vegetative neurotic symptoms and certainly these individuals form the majority of morphinists, certainly because these vegetative neurotic symptoms are attacked especially well by morphin. A clinical fact may also be explained by this hypothesis: our therapeutic ignorance in relation to the symptoms of withdrawal which, so to speak, is comparable to the lack of suitable treatment for Basedow's disease with its sympathetic and parasympathetic symptoms of irritation. What we lack is a drug which reduces the parasympathetic symptoms not only as atropin controls the individual symptoms (perspiration, diarrhoea, vomiting) but as a paralyzant on the endocrine vegeta-

tive tonus, i.e., sympathetic. I should like to state that perhaps the sketched hypothesis will lead to the further observation and analysis of the individual symptoms in morphinists, in place of considering them unavoidable complaints as well as the refusal in the future to be resigned to the lack of suitable therapeutic measures but rather undertake studies suited to the individuality of the case with drugs of the alkaloid series and products of inner secretion. In conclusion I should like to remark that this hypothesis in no way will explain the whole problem of morphinism but only a few of the important factors which perhaps also in other diseases—cocaine, alcohol,*—play an important role."

Sir W. H. Willcox—1923.[90]

"That the condition is caused by morphine and its allies is well known, and the symptomatology is well recognized as a definite symptom-complex. The explanation of why withdrawal symptoms occur is yet to be worked out. American observers, foremost amongst whom is Dr. E. S. Bishop, assert that the taking of morphine leads to the formation of an antidotal substance in the body, which neutralizes the large amounts taken by the addict. It is asserted that this antidotal substance is itself very toxic, and that it continues to be produced in the body if the drug is discontinued. At this stage withdrawal symptoms develop and they are only relieved by a further dose of the drug, which acts by neutralizing the toxic antidotal substance.

"This theory, fascinating as it seems in the ready explanation of the production of withdrawal symptoms, has not yet received adequate experimental confirmation. Professor W. E. Dixon, in an address on the drug habit (British Medical Journal, November 19th, 1921), states that neither morphine nor any other drug causes antibody formation. On the other hand, Valenti rendered dogs tolerant to morphine and found that on suddenly stopping the drug typical withdrawal symptoms occurred. He alleged that injection of the serum from dogs showing withdrawal symptoms caused similar symptoms to develop in normal dogs.

"Professor Dixon suggests as an explanation of withdrawal symptoms that nerve cells, after prolonged narcosis, become on reawakening hyperexcitable, and that a further dose of drug is necessary to allay this condition. The fact that increasing quantities of morphine and cocaine are required by addicts can be accounted for by the increased power of destroying these drugs which is developed by the tissues of the addict.

"Another explanation of addiction disease which, I think, should be the subject of pathological research, is the probability that definite changes of a degenerative type occur in the nerve cells of the brain, and that this pathological change leads to the formation of abnormal channels of transmission of nerve impulses, whereby abnormal physical and mental effects are produced. It is well known that toxic substances, such as chloroform, affect nerve cells, causing degenerative changes, demonstrable by Nissl's methods of staining, and it seems likely that similar changes may occur in drug addiction. This view of the subject offers an explanation of the incurable nature of drug addiction in patients who have taken large quantities of morphine, heroin, or cocaine for many years.

---

* Chronic abuse of alcohol produces disturbances of the thyroid (Sarbach).

[90] Willcox, Sir W. H.—Norman Kerr Memorial Lecture on Drug Addiction. British Med. J. Dec. 1, 1923. No. 3283. pp. 1013-1018.

"Scientific research is sorely needed on the pathology of drug addiction, and there are hopeful signs of light being thrown on the subject in the near future, since special investigations are already in progress.

"The Ministry of Health has recently appointed a committee to inquire into the substitutes for cocaine and the possibility of drug addiction arising therefrom. It is hoped that valuable information may be forthcoming from this inquiry which will throw some light on the pathology of drug addiction."

J. A. Gunn—1923.[91]

This author contributes a comprehensive review of the literature on tolerance to non-protein substances. In an introduction he states:

"It is now well known that, when acquired immunity is induced in warm-blooded animals to toxins, bacteria, or indeed to any protein substance, this immunity is accompanied by, and at least partly due to, the formation of specific antibodies in the blood or tissue fluids. No such antibodies are formed to non-protein substances, though to some of the latter a high degree of immunity can be acquired. This fundamental distinction has been emphasized by the retention of the word 'immunity' as applied to proteins, and by the restricted use of the word 'tolerance' as applied to non-protein substances. While this difference in nomenclature is convenient and in part salutary, there is a danger that the distinction may overleap itself and fall on the other side; and this for two reasons. In the first place it has tended often to lead to a tacit and unjustifiable implication that the processes whereby an animal acquires tolerance to non-protein substances do not occur in immunity to proteins; and, secondly, the distinction does not hold good for congenital immunity, because there is no doubt that congenital immunity both to protein and non-protein substances is in many, and possibly in most, cases due to an insusceptibility of the cells themselves to the toxic action of the substance, and independent of any antagonistic effect of the body fluids.

"While, therefore, it will be possible in the space of this review to deal only with tolerance to non-protein substances, the object of it is a twofold one. The subject of tolerance to drugs possesses its own interest and importance, but any considerable review of the whole subject has not to my knowledge been attempted since that by Hausmann in the Ergebnisse der Physiologie in 1907. This résumé deals largely with investigations subsequent to that date, and in the necessary selection of material I have chosen rather to consider in some detail only those instances of tolerance which have received some explanatory investigation, than to attempt to mention every known instance of tolerance. The primary object of this review is therefore to give a general survey, from a scattered literature, of the present state of knowledge of tolerance to drugs. But, in addition, it may serve a purpose of providing a brief statement of the methods, other than by antibody formation or phagocytosis (neither of which has suffered from lack of attention) whereby an organism can acquire immunity, for it is conceivable that even in the case of genuine "immunity" these methods of defense will be found to play a more important part than has hitherto been realized. In any case perhaps this introduction will help to justify the title of the article, for it will be seen that tolerance to drugs is dependent mainly upon properties or activities residing in the cells themselves. All immunity is of course ultimately cellular for antibodies are formed by the cells, so that even the expression 'cellular immunity' is one only of convenience."

---

[91] Gunn, J. A.—Cellular immunity; Congenital and acquired Tolerance to non-protein Substances. Physiological Review. Jan. 1923. Vol. 3. pp. 41-74.

After a consideration of the works of the various observers, Gunn reaches the following general conclusions as to acquired tolerance to narcotics:

"The foregoing account of the present state of knowledge in regard to acquired tolerance to hypnotics would have little value beyond a mere catalogue of results, were no more general conclusions deducible from them. A wide survey seems however to reveal certain points of unanimity that may now be summarized, even if they be regarded in the meantime as merely provocative. Among drugs generally, it is chiefly to depressants of the central nervous system that tolerance can be acquired,—to alcohol, chloral, morphine, etc., rather than to e.g., codeine, strychnine or other alkaloids. When a substance combines a depressant action on certain parts of the nervous system with a stimulant action on other parts of the nervous system or with other physiological actions, it is to the former chiefly or only that tolerance is established. The experiments of Van Egmond, Van Dongen and Tamura with morphine, of Langer with heroin, and of Biberfeld with paracodeine are all in agreement on this point. In regard to these hypnotics therefore acquired tolerance is largely if not entirely due to the fact that certain parts of the central nervous system can acquire an increased resistance to the action of depressants. It may not be accidental to this that tolerance can be acquired the more easily in different animals in proportion to the higher development of the brain, e.g., in the order man, dog, rabbit, frog. The fact that some degree of tolerance can be acquired to alcohol, chloral, veronal, morphine, cannabis indica, hyoscine, substances with little or no chemical similarity but which agree in being cerebral depressants, suggests strongly that tolerance is more intimately connected with their actions on the nervous system, in which they agree, than with increased destruction of them, in the mechanism of which they must necessarily disagree. Experiments dealing with destruction of alkaloids, etc., by the tissues are not only negatively useless but may be positively misleading unless a very exact method of quantitative estimation is employed."

The author also states the following in regard to the destruction of drugs by the body tissues:

"One very important problem which has repeatedly arisen in the foregoing discussions relates to the methods by which drugs are destroyed in the body,—whether, for example, congenital tolerance is due to superior destruction of the drug by the more tolerant animal, and whether destruction can be increased by habituation. The experimental investigation of these problems is difficult because it is not an easy task to follow the fate of a drug quantitatively from the time of its injection to the time of its complete disappearance from the body, and this difficulty is reflected in the conflicting results which have been obtained. It is believed that alcohol, atropine, morphine, strychnine—to mention only a few drugs,—are partly destroyed in the body, that this destruction is due to ferment action, and that the liver is the organ usually chiefly responsible for the destruction. There is no difficulty in imagining that alcohol may be destroyed in the body, for according to some it is normally present in the blood in small quantities, and in any case is closely related to substances which the body normally destroys. On the other hand it can hardly be supposed that there are *specific* ferments in the body which are lying in wait in the hope that some day a suitable alkaloid will be presented to them for attack. It is highly probable therefore that if alkaloids are destroyed by ferments, the usual business of those ferments is to destroy substances normally occurring in the body, e.g., decomposition products of proteins, amines, etc. It may well be that different animals, according to differences in their diets, etc., may have different powers of destroying alkaloids, and that congenital tolerance may be due sometimes to these differences.

"When it comes however to the questions (a), whether an animal can acquire by habituation a destructive action which it originally did not possess; or (b), whether it can by habituation increase such a power if preëxistent, the difficulties are greater. In regard to the first question, the destruction of the benzene ring compounds may afford a parallel. The body can destroy the benzene ring of those aromatic aminoacids which enter into the composition of proteins, whereas the benzene ring of foreign aromatic compounds is usually left intact. The condition of alkaptonuria especially shows that when there is a congenital absence of the enzyme which destroys homogentisic acid, this ferment action is never gained throughout life, though the substance to be destroyed is being constantly formed from the food. This seems to be one certain example of the complete inability of the body to form a new enzyme in response to habituation.

"In regard to the second question, it is quite possible that ferment activity can be artificially increased, because animals fed for a long period on one particular kind of food may develop an abnormal ferment activity for this particular food. The difficulty in regard to, e.g., alkaloids would seem to be this. The ferment that destroys them is one that presumably normally destroys some other substance and it is difficult to imagine how this ferment can be increased by the minute quantities of alkaloid (e.g., of nicotine) which enter the circulation. In other words, one would imagine that there would be even larger fluctuations from day to day in the amount of substance that the ferment normally destroys than would be afforded by the addition of the alkaloid.

"At all events these considerations would seem to urge a caution against accepting results which have claimed to show an augmentation of destruction of alkaloids given in small amounts and for short periods and especially those results which claim that a new power of destruction can be originated by habituation."

B. Legewie—1924.[92]

"A consideration of the mechanism of abstinence forms the most difficult part of the problem. Here as in tolerance the psychiatric literature especially is very meagre and it perhaps would not be inadvisable to review a few of the important opinions and results of investigation on the subject.

"A consideration of this question becomes difficult by reason of the complex nature of our conception of morphin tolerance. In this respect there are four main points to be considered which have become more or less prominent. In the first place we must consider the pharmacologic or toxic changes (euphoria, insensibility to pain, respiratory paralysis, etc.) which morphin produces in the central nervous system forming the characteristic symptoms of addiction. But this conception further signifies that one has become tolerant to the drug, since it produces no further marked effects and is no longer poisonous; but further it signifies that such a degree of addiction has been reached that the patient can no longer do without it on any basis, which bears a relationship to the fourth point to be discussed later; and finally in special cases there are peculiar symptoms due to the absence of the usual effect of a drug, when it is given in the same dosage, so that after a short time increased doses are required to obtain the same effect. In the third place in our conception of morphinism we have the marked abstinence symptoms and finally in the fourth place there is the morbid desire, an eager longing for further administration which the drug bequeaths to many men after they have become familiar with it. All of these four basic considerations of the pharmacologic action, of tolerance, of abstinence, and of morbid desire belong together and constitute what we understand to be morphinism when this or that cause is more prominently mentioned. Yet one explanation of the mechanism of morphinism must apply to them all. It is only through the fact that first the one partial symptom and then the other is brought into the foreground, that one seeks only to explain this as the most marked symptom, that we can understand that investigators always have obtained only partial results, which have not brought us really close to an understanding of morphinism. This is especially true of the experimental investigations in the field of pharmacology, where a number of individual pieces of work have been done, which, however, have not yet made us comprehend the whole picture."

* * * * *

"I think that in the first place the immediate appearance of abstinence upon the withdrawal of the drug forces us at once to assume a direct dependence of abstinence upon the morphin. The next natural assumption appears to me to be that with the withdrawal of the morphin the body lacks a substance which has in the meantime become necessary for the carrying on of its work, a constituent, a means of subsistence. The morphin at first harmful becomes necessary to the body, necessary to life, and now can be dispensed with only at great expense to function. There appears a close relationship between the body and this drug for which it has to pay dearly since there is no permanent benefit. Physiologically speaking there must be a high physico-chemical affinity of morphin or its decomposition products for certain cells in the central nervous system. This is so apparent that the body in the beginning is not able to bind given amounts of morphin in its nervous system but can take on the ability to react only step by step; the body *becomes educated* to the new relationship and there develops tolerance. Also the cell function becomes modified through this changed cell relationship. If now the morphin is taken away there is produced a vacuum, a functional disturbance, abstinence, which is gradually compensated for again. The process is therefore reversible, but in this case the organism must again adjust to it. A very long period of time must elapse before recovery of the early balance in cell and organism.

---

[92] Legewie, B.—Delirium bei Morphinismus. Zugleich ein Beitrag zur Frage der Morphingewöhnung. Ztsch. f. d. ges. Neurol. u. Psychiat. 1924. Vol. 89. p. 558-578.

"How far my hypothesis can be supported by early experimental work and whether they are in agreement I should like to consider briefly in the following."

After reviewing the literature, he states:

"If we summarize the results, we shall find that the action of the morphin brings about a change in the function of the brain cells in such a way that the morphin is bound in increasing degree by them and especially by their lipoid constituents and is destroyed in a sense, i.e., it cannot be recovered. There results a new functional unity which explains the one side of the mechanism of addiction. The question as to why increasing doses become necessary with time is also answered in the sense that the increased binding or ability to destroy of the brain itself makes possible a need for increased morphin supply. This means that the morphin has become a constituent necessary to life. It cannot be dispensed with easily. And upon the cutting off of the drug functional disturbances appear which are the abstinence symptoms. Thus we see how all of these questions are closely related and can be explained on the same basis. For this reason it occurred to me to consider and study critically at the same time all phases of the mechanism of morphinism in their close relationships to each other. Even the last item for consideration may be accounted for. The morphin craving is only an objective symptom of an especially rapid and intensive affinity of morphin for the cell in different men. From a psychological point of view, this morbid desire belongs to the field of psychopathology and is therefore a purely human problem, an expression of high psychical function. I should like to refer here especially to the excellent studies of E. Straus. But we must not overlook the fact that this question is dependent also upon the characteristic of the chemico-physical reaction of the brain cells in the sense that the problem of psychopathology is brought into direct relationship with organic processes.

"The foregoing conception of morphinism which was forced upon me on the basis of clinical facts, as I found in a review of the literature, was advanced twenty years ago in the experimental work of Cloetta. 'The morphin has ceased to be a harmful constituent for the brain lipoid,' and in another place he says: 'The increased binding and ability to destroy of the brain probably is conditioned by a certain *need* of the cell for this substance; and the *withdrawal signifies a ceasing of the daily function of the organ.*' Later Schübel and then Loofs supported these ideas.

"Naturally there are still difficulties. I have mentioned both main points before. When we say that the brain cell is *educated* in gradually increasing degree to bind the morphin, then we are considering this fundamental problem of addiction as that which it is, namely, as a fundamental biological characteristic of the living cell. As such it appears to be as life itself accessible to no further explanation. Every explanation must stop here. Even Faust had to say the body *becomes educated* to destroy the morphin in increasing degree and for the same reason the question as to how the one reacts this way and another that way to morphin is very difficult to answer. We can only come to the conclusion that in living cells there is a process, a chemico-physical one, which still depends on factors which we do not know and cannot demonstrate in the test tube. In the same way also the different behavior of the individual parts of the central nervous system have yet to be explained.

"If thus perhaps we never come to a satisfactory explanation my hypothesis may be considered only a modest contribution to a biological explanation of morphinism in consideration of a uniform conception of the whole range of the subject and the presentation of the most important work so far accomplished in this field."

A. Fauser and B. Ottenstein—1924.[93] [94]

These authors have developed an hypothesis demonstrated by animal experimentation concerning the mechanism of dependence and the related withdrawal phenomena, which is based on the physico-chemical relationship between the drug and the body cell, in which the permeability of the cell membrane plays an important rôle.

The authors set forth the importance of the relationship between certain psychopathological symptoms and physico-chemical body changes. In a former paper[95] one of them, Fauser, had already expressed agreement with Schade's claim that certain sensations of "uneasiness," the "desires of pregnancy," etc., are due to a disturbance in the H-OH ionic relationships and Na-, K- and Ca-disturbances. They continue as follows:

---

[93] Fauser, A. and B. Ottenstein—Chemisches und Physikalisch-Chemisches zum Problem der "Suchten" und "Entziehungserscheinungen," insbesonders des Morphinismus und Cocainismus. Ztschr. f. d. g. Neurol. u. Psych. 1924. Vol. 88. p. 128-133.

[94] Ottenstein, B.—Tierexperimentelle Untersuchungen zum Problem der Suchten und Entziehungserscheinungen, insbesonders des Morphinismus. Arch, f. exp. Path. u. Pharm. Vol. 100. p. 349-352.

[95] Fauser, A.—Versuch einer Begründung von Zusammenhängen zwischen gewissen elementaren psychopathologischen Symptomen und physikalisch-chemischen Zustandveränderungen des Körpers. Ztschr. f. d. ges. Neurol. u. Psychiat. 1923. Vol. 81. pp. 497-516.

"Among the abstinence symptoms observed in the different kinds of craving in addition to certain motor symptoms there are other distressing sensations of varying degrees of quality and intensity. The 'craving' itself may be considered a mild 'abstinence symptom' which induces the patient to take again the drug to which he has become accustomed—just as if it were a substance necessary to life. Without further reference to the empirical facts to be discussed later, the following hypothesis may be advanced at this point: The 'craving' and resulting 'abstinence symptoms' depend on the fact that the given substance becomes a constituent part of certain body cells so that a continuous supply is required in order that the cells may not be ionically disturbed ('craving'), or that the cells are changed in constitution—modified through addiction—, if their supply is withdrawn or appreciably lessened ('abstinence symptoms').

"For an understanding of this hypothesis we must examine the results of those who have studied the physical chemistry of the cell. . . . This brings into consideration the osmotic property of the cell and the question of permeability; I shall refer here simply to the fact that the permeability of different plasma membranes as well as of one and the same plasma membrane varies at *different* times and that it behaves *electively* towards the penetrating substance. In the laboratory experiments to be described later we undertook to obtain, according to the procedure of other authors (for example, Höber) a *model* (artificial lipoid membrane) which duplicated the conditions in the cell and to test the measure of the permeability for the given alkaloid bases and their salts. In these experiments we were forced to the significant—in the light of our hypothesis—conclusion that some of these substances, particularly those with which we were concerned, *morphin* and *cocain,* differed considerably in regard to the speed with which they passed through the membrane. As we found upon a review of the literature (Höber) that some French authors—for entirely different purposes—had studied a long series of alkaloids, i.e., strychnin, quinin, brucin, and especially morphin, cocain, stovain, in relation to their permeability, let us examine the results already obtained by these authors; our own results which agreed with those just referred to and which we obtained according to the same procedure will be published later in a special report by Frl. Dr. O."

The French authors, they state, found that when a 1% solution of the substance was introduced into an artificial lipoid membrane there was a marked difference in the rapidity of transfer of stovain, cocain and morphin, the first being the quickest to penetrate and morphin the slowest.

In showing the relationship of these facts to their hypothesis they point out that clinically morphin deprivation shows itself very late, only after the drug has been used for six months or longer, that these symptoms are very severe when morphin is suddenly withdrawn, and that those of cocain develop rapidly and are only moderate in severity upon its withdrawal. They believe that these different effects depend perhaps on the differences in the rapidity of osmotic transfer of morphin on the one hand and of cocain on the other. They state:

> "Surely we may entertain the idea that if the permeability of a substance through the plasma membrane into the cell is slow, it will take a long time for the substance—under the effect of an elective storage—to become a permanent constituent of the cell, but that on the other hand the disappearance again will be slow; if then through a sudden withdrawal of the accustomed drug, the flow of this constituent by which the cell is washed ceases, a long time is needed to restore the osmotic balance . . . between the cell and the outside fluids (blood, lymph, tissue fluid): the opposite is true in the case of *slightly* permeable substances. Therfore this indicates a close agreement between the above hypothesis and the experimentally determined facts."

They refer to Faust's theory of increase of oxidation as an explanation of the lack of morphin in the feces and ask if this is not due rather to a retention. Here they think is a therapeutic possibility, namely, the arbitrary modification of penetration velocity or the inducing of changes in cell permeability with thermic influences or the use of hypertonic solutions ("osmosis therapy") to favor the osmotic balance and thus reduce the duration and intensity of the abstinence symptoms.

In animal experiments designed to support their hypothesis, the authors state that they have obtained results similar to those of Wachtel[96] who found, in spite of the injection of uniform amounts, variable and uncontrollable quantities of morphin in different organs. In this connection they say:

> ". . . . Wachtel himself could not explain these confusing results—perhaps our hypothesis can throw some light on this apparent irregularity on the basis that there is a *difference* in the affinity (in a biologic sense) of morphin for *different* organs or organ cells ('elective behavior of the cell membrane', 'elective storage'). Babel also thinks that certain brain cells show a greater specific affinity for morphin than others and that the alkaloid is in direct contact with certain elementary constituents of the organs. Schübel has expressed this behavior in chemical terms as follows: the chemically foreign body morphin replaces directly certain basic constituents of the given cells of the central nervous system. According to Fauser then the 'morphin addiction' and 'withdrawal' mean that on the administration of the morphin the morphin takes the place of a cell constituent and that then on sudden withdrawal there occurs a disturbance of the cell balance in a physico-chemical sense or an alteration in the physico-chemical state, according to which the functional disturbances of the cell as evidenced by the withdrawal symptoms may be explained. The explanation of morphinism,

---

[96] Biochem. Ztschr. 1921. Vol. 120.

cocainism, etc., and the disturbances relating thereto, may have the same basis, therefore, as that of normal nutrition, of the H-OH, Na-, K-, Ca-balance, etc., and the related disturbances; the explanation of the 'craving' and 'abstinence symptoms' may be the same as the explanation of the 'normal hunger and thirst sensation,' of salt deficiency, of the sensation of shallow respiration and of the morbid appetite of pregnant women. . . .

"Here is involved a problem such as those frequently met in the new developments of science, especially in the field of biology: problems which belong to so many and different fields that a single head can, it is true, comprehend their general significance, but cannot alone master all of the technical relationships; this requires the combined effort of clinicians who from a most practical point of view are also trained in psychology and psychiatry and analytical and physical chemists."

T. Takayanagi—1924.[97]

After reviewing the work of Faust, Rübsamen, and van Egmond relating to the fate of morphin in the body, the author describes as follows his experiments in which he sought to confirm Rübsamen's results by the application of a more accurate method of morphin determination: [98]

"Some of the rats were injected once, others repeatedly, with morphin. At various intervals after injection they were killed, passed through a meat-chopper, and tested in accordance with my method, previously described, for the amount of morphin present."

* * * * *

"In the acute experiment a large number of rats were injected subcutaneously, some with 60 and some with 30 mgm. of morphin hydrochloride. The animals were killed after intervals of from 2 minutes to 6½ hours. Usually, those rats which had received 30 mgm, of morphin showed, after ½ to 1 hour, severe symptoms of intoxication and were completely recovered after about 6 hours. Of the entire series receiving this dose but 2 died.

"From the amounts of morphin recovered it appeared that the morphin underwent a progressive destruction, and that after 6 hours the entire amount had been eliminated from the body. With animals of approximately the same size the destruction is somewhat proportional to the time, although a rather wide distribution of values was observed. The animals which received 60 mgm. were severely intoxicated and a number of them, as seen by the incomplete experiments, died within 3 to 4 hours. After a dose of 60 mgm. a rat cannot remain alive for more than 5 hours. Here also the destruction of morphin parallels the time factor, the destruction reaching a maximal value of 51%. None of the animals recovered.

---

[97] Takayanagi, T.—Uber das Schicksal des Morphins im Tierkörper. II. Mitteilung: Uber die Zerstörung des Morphins im Körper gewöhnter und ungewöhnter Ratten. Arch. f. exper. Path. u. Pharm. 1924. Vol. 102. p. 183-187.

[98] Takayanagi, T.—Eine Methode zur quantitativen Bestimmung des Morphins in Körperflussigkeiten und Organen. Arch. f. exper. Path. u. Pharm. 1924. Vol. 102. p. 167-175.

"In order to addict the animals to morphin a large series of rats were given daily subcutaneous injections, the dose increasing from 6 to 30 mgm. During the treatment the weights of the animals were watched and the dosage was increased only when the animals maintained their weight and showed no severe symptoms of intoxication. In spite of this care a very considerable percentage of the animals died during the immunizing course, particularly when the procedure was being carried out during the colder months. The treatments for developing tolerance extended in some instances over 7 days, in others over 14 days. After this period of immunization was terminated some of the animals were given, subcutaneously, 30 mgm. of morphin, others receiving 60 mgm. After this dose they were sacrificed at intervals varying from 10 minutes to 3 hours. The amount of morphin present was determined as for the non-addicted rats. In none of the immunized animals were there visible symptoms of intoxication following the last injection.

"In all experiments, at one time or another, an amount of morphin was found to be present such as would have induced severe intoxication phenomena in non-addicted rats. Nevertheless the quantities of morphin found indicated a rate of destruction which very considerably exceeded that observed in non-tolerant animals. As a rule the rate of destruction in animals which had been immunized throughout a period of 2 weeks considerably exceeded that taking place in the animals subjected to immunization for but 7 days.

"These results agree with those reported by Rübsamen, although in the animals of the experiment here reported the rate of morphin destruction, both in the addicted and in the non-addicted rats, was considerably greater than that stated by Rübsamen, viz., that tolerance to morphin consists in a more rapid destruction of the alkaloid together with an increased immunity of the cells for the toxic agent."

J. D. Pilcher and Torald Sollmann—1924.[98a]

In a study of the effects of solutions of morphin and its esters when introduced into the skin, these authors state that lesions similar to those produced by the local inoculation of foreign proteins are produced in susceptible individuals. Whether or not a high degree of tolerance to toxic actions of morphin in addicts extended to the local reaction was one of the interesting questions involved. They reached the conclusion that the local reaction is not at all modified by the acquirement of systemic tolerance; that it is the same in patients during the various stages of habituation and dishabituation as it is in normal individuals. On the contrary, this skin-test by intracutaneous injections is, they claim, remarkably uniform in the great majority of subjects, normal or addicts, irrespective of sex and color. Their method of procedure and observations are given as follows:

[98a] Pilcher, J. D., and Torald Sollmann—The skin-reaction to morphin. A.M.A. 1924. Reprinted from Archives of Internal Medicine, April, 1924. Vol. 33, pp. 516-524.

"The intradermal method was used in preference to the scratch methods, since the former not only acts with much smaller concentrations, but also permits a much better control of the quantity of solution introduced into the skin, and therefore gives more uniform results. The injections were made into the cutis of the flexor surface of the forearm, a sufficient quantity of the solution being introduced to produce an immediate distention wheal about 5 mm. in diameter. A control wheal was made with physiologic sodium chlorid solution containing 0.25 per cent. of tricresol; and the course of this was compared with that of strictly similar wheals produced by the solution with the addition to morphin hydrochlorid, in the proportions of 1:1,000, 1:100,000 and 1:1,000,000. The latter solution gave either no reactions beyond that of the saline control, or only a minimal increase. The 1:100,000 solution always gave mildly positive reactions. With the 1:1,000 the response was always so marked that it was deemed superfluous to employ more concentrated solutions. This illustrates the lower sensitiveness of the scratch method, which gives at most slight reactions with the 1:1,000 solutions. A number of experiments were also made with a 1:10,000 solution, but as this gave no additional information, its use was discontinued. The total quantity of morphin introduced at a complete test, comprising three injections, is about 0.1 mg. (1/600 grain), so that there is no possibility of any perceptible systemic effect whatever; nor was any such effect ever noticed by either normal subjects, addicts, or exaddicts.

"OBSERVATIONS

"The injection sites were usually observed at five, fifteen, thirty, sixty and 120 minute intervals following the injection, the size of the wheal and of the erythematous area being measured. As the reactions subside, the outlines of the wheals and, to a less extent, of the areola become less and less distinct, so that accurate measurements are impossible. The reactions were then recorded as 'fading' or 'faded.'

"*Normal Course of the Morphin Reactions.*—As has been stated, this is remarkably uniform, although minor quantitative variations are found, even in the same individual; for one thing, because it is not practical to introduce exactly the same quantity of the solution into the same area of skin. These accidental variations may be smoothed out by multiplying the observations; and since the conditions observed by us did not modify the course of the reactions, we may employ the medians of the entire series of about eighty subjects as a basis for the 'normal course.' The phenomena are most typical when they are most marked, i.e., with the 1:1,000 solutions.

"*Course of the Reaction to the 1:1,000 Solution.*—There is a momentary stinging sensation, but exceptionally a little pain. Then the primary 5 mm. wheal, produced mechanically by the intracutaneous injection, becomes rapidly reddened, increases in size and is surrounded by a congested area of rather irregular outline.

The maximum intensity is reached in from five to ten minutes, seldom later. The wheal is then about 12 mm. in diameter, somewhat doughy, moderately raised above the surrounding skin, rather sharply circumscribed and fairly circular, but sometimes having a few pseudopods. It is surrounded by an erythematous areola having the diameter of from 4 to 6 cm.; bright or 'angry' red near the wheal, paler and somewhat mottled toward the periphery. Usually the size of the wheal and the congested area were roughly proportional; i.e., the larger the wheal, the larger the congested area. There were exceptions, as illustrated by two experiments with the 1:1,000 solution: One subject, aged 55, had a wheal 1.6 cm. and a congested area 4 cm. in diameter; while a second subject, aged 23, had a wheal 1 cm. and a congested area 6.8 cm. in diameter. This variation is probably due to want of parallelism between the permeability and dilatation of the skin capillaries.

"*Subsequent Course.*—Usually within fifteen minutes after the injections, the phenomena begin to subside. The wheal becomes flatter and paler, and its borders are less distinct. The areola decreases in size and color. The fading progresses rather slowly. In an hour after the injection, the areola is quite faint, and the site of the wheal pale, and still indurated, but not elevated above the surrounding skin. Somewhat later, one and one-half or at most two hours after the injection, all visible trace of the reaction has disappeared."

The subjects used in the experiments were classified by the authors as follows:

"Group A: Current addiction: Five subjects who were receiving from 3 to 5½ grains of morphin a day from the Narcotic Bureau.

"Group B: Abstinence symptoms: Eighteen subjects still receiving morphin or diacetylmorphin in reduced, but still large dosage (usually from 1 to 4 grains (0.065 to 0.260 gm.) on the day preceding the test), and showing abstinence symptoms, slight in about two-thirds of the patients, severe in the others.

"Group C: Complete withdrawal (short, i.e., of from ten to twelve days): Ten subjects. Abstinence symptoms had completely disappeared.

"Group D: Complete withdrawal (intermediate, i.e., of from two to ten weeks): Nine subjects.

"Group E: Complete withdrawal (long, i.e., of from six to seven months): Nine subjects.

"For comparison with these, we have two groups of nonaddicts:

"Group I, normal: Seventeen normal individuals who had never used opiates habitually, and many of whom had never received effective doses even therapeutically.

"Group II, therapeutic: Four subjects who had never been addicted to opiates, but who for therapeutic purposes had received several small doses in the hospital on the days preceding the test.

"The comparative results as to intensity and duration of the reaction may be illustrated by the observations for from five to thirty minutes after injection, as shown in Table I. The data for all the other periods have been similarly

TABLE I

COMPARISON OF INTRADERMIC MORPHIN TEST IN ADDICTS AND NONADDICTS *

	Morphin Hydrochlorid 1:1000				Morphin Hydrochlorid 1:100,000				Morphin Hydrochlorid 1:1,000,000			
	Wheal		Areola		Wheal		Areola		Wheal		Areola	
	5 Min.	30 Min.	5 Min.	30 Min.	5 Min.	30 Min.	5 Min.	30 Min.	5 Min.	30 Min.	5 Min.	30 Min.
Nonaddicts:												
Group I—Normal....	12.5	F	43	37	9	F	30	F	+	0	0	0
Group II—Therapeutic	—	F	—	F	—	F	—	F	—	0	—	+
Addicts:												
Group A—Current addicts..............	12	F	40	F	10	7	30	F	+	0	+	F
Group B — Abstinence symptoms.........	12	F	44	F	8	F	16	F	+	0	+	0
Exaddicts:												
Group C—10 to 12 days	11.5	F	43	F	8	F	17	0	+	0	0	0
Group D—2 to 10 weeks	12	—	45	—	8	—	27	—	0	—	0	—
Group E—6 to 7 months	12	F	50	42	8	F	25	F	0	0	+	0
General average of all groups..............	12	F	44	F	8	F	26	F	+	0	+	0

* The numbers correspond to the median diameter in millimeters of the wheal or areola in addicts, exaddicts, and nonaddicts; F indicates that the response has faded materially; 0, that it had disappeared practically completely; + indicates a positive reaction, but too slight for measurement.

tabulated, but need not be reproduced, as they merely confirm the conclusions in Table I.

"A glance at the table shows the identity of the figures in each vertical column; i.e., the identity of the reaction of all the groups, as concerns the maximal or the minimal concentrations, or the intensity or duration of the response.

"Table 2 illustrates that the extremes, as well as the medians, are uninfluenced by habituation.

TABLE II

EXTREME VARIATIONS OF THE MORPHIN REACTIONS *

	Wheals	Areola
Nonaddicts..................................	11–18	20–65
Addicts:		
Group A..................................	14–14	30–45
Group B..................................	9–20	14–60
Exaddicts:		
Group C..................................	10–18	30–60
Group D..................................	10–20	40–60
Group E..................................	9–13	65–67

* Measurements (mm.) 15 minutes after injection of a 1:1000 solution. The lettering of the groups is as in Table I.

"COMPARISON OF THE MORPHIN TEST OF WHITE AND COLORED RACES

"Whether the greater resistance of the negro-skin to certain irritants such as light, and dichloridethylsulphide, extends also to morphin seemed worth investigating. We utilized thirteen negroes of light to very dark skins belonging to various addiction groups; but as we have shown that addiction does not alter the response, they may all be grouped together. The results are shown numerically in Table III. Only the numbers for the wheals of the five-minute period are reproduced.

TABLE III

MEDIAN DIAMETER (MM.) OF WHEAL AFTER 5 MIN.

	Morphin hydrochlorid		
	1:1000	1:100,000	1:1,000,000
White	12	8	0
Colored	12	9	0 +
General average	12	8	+

"The wheal response is evidently identical. The color of the areola cannot be differentiated sharply from the dark color of the surrounding normal skin of the negro, although it can be seen somewhat dimly. In the lighter mulattoes, the reaction is sufficiently visible for measurement, and then averages the same as in the white race."

The following are the authors' conclusions:

"1. Morphin administered intradermally produces a wheal surrounded by a congested area, the reaction increasing in intensity and duration with the concentration. The minimum concentration of 1:1,000,000 was effective in about one half the experiments. A 1:100,000 solution always produces a wheal and congested area.

"2. The reaction reaches the maximum in from five to fifteen minutes and disappears in from one to two hours.

"3. The reaction is in every respect the same in addicts and in normal individuals. Systemic tolerance of morphin, therefore, does not induce local (skin) tolerance.

"4. The reaction is identical in the young and in old adults; in males and females; in the white and negro races.

"5. The reaction is probably somewhat more marked in skins of fine texture.

"6. The presence of edema greatly lessens the wheal formation, and in extreme cases of edema, abolishes it."

A. G. DuMez and Lawrence Kolb—1925.[99]

These authors undertook two groups of experiments to determine whether transferable immunizing substances are present in the blood serum of chronic morphin and heroin users. In the first group after finding the minimal lethal dose of morphin sulphate for white mice to be 0.45 mg. per gram-weight and that of heroin hydrochloride to be 0.2 mg. per gram-weight, the protective effect of the addict serum against these doses was tested in the mice. In the second group the protective effect of the addict serum was tested against increasing doses of the drugs, starting with a very low sublethal dose and ending with an absolutely fatal dose. The authors concluded that—

> "Both groups of results . . . fail to show that the effect of subcutaneous injections of morphine and heroin addict blood sera into mice receiving lethal doses of the respective drugs of addiction differs from that produced by the injection of non-addict sera—a slight protective action being observed in both cases, as has been discussed. It is therefore concluded that the blood of human beings addicted to these drugs does not contain transferable immunizing substances."

Congenital Addiction.

Another interesting phase of tolerance is evidenced in so-called "congenital addiction," or the tolerance claimed to be exhibited by the foetus and the new-born child of a mother suffering from chronic opium intoxication during pregnancy. We are giving below the reports of such cases as our study of the literature and of our questionnaires revealed. These cases are mentioned generally without speculation as to the mechanism involved and quite regardless of the views as to the nature of tolerance held by the writers.

Ch. Féré—1883.[100]

Féré reported to the *Société de Biologie* a case that Charcot tried to treat by rapid reduction,—a pregnant woman who was taking not more than 25 cg. of morphin a day. As soon as the dose was appreciably decreased the foetus became so violently active as to threaten abortion. For several months it was necessary to continue the drug and it was not stopped finally until a month after delivery. The child showed symptoms of chronic morphin intoxication after birth. He was normal in size but thin. His movements were jerky and he was very nervous, crying for sixty hours without sleeping. After this his symptoms abated and he recovered.

---

[99] DuMez, A. G. and Lawrence Kolb—Absence of Transferable Immunizing Substances in the blood of Morphine and Heroin Addicts. Public Health Reports. V. 40. No. 12. March 20, 1925. p. 548-559.

[100] Féré, Ch.—De la morphinomanie au point de vue de la grossesse et de la né du foetus. Communication à la Société de Biologie. Semaine Médicale. 1883. p. 294.

D. A. Zambaco—1884.[101]

Zambaco mentions this case of Charcot's and two others in which the children lived and were normal in development. He concludes that the danger lies in withdrawing the drug during pregnancy.

F. B. Earle—1888.[102]

Earle reports a case of a baby born at full term which, at the end of its third day, seemed particularly sensitive to motion, was pale and pinched and prostrate. Twelve hours later it died. The mother of this baby at the time of its birth was a chronic opium user.

In the discussion of Earle's paper, another physician reported attending a woman in confinement whose child, deprived of mother's milk, showed similar symptoms.

Further discussion of Dr. Earle's paper was reported as follows:

> "Dr. Kiernan said that the influence of drugs like morphine on the maternal organism was exerted on the reproductive apparatus and the ovum. As has been shown by naturalists certain species of pigeons, whose ancestors had fed on poppies, were relatively intractable to opium. And the same fact was pointed out by Dr. Murrell about persons descendant from Bedfordshire (Eng.) natives, whose ancestors had used infusions of poppies, as a prophylactic against malaria. The infantile mortality among these people was not stated, but nervous diseases were relatively prevalent in these districts. As Morel had pointed out, narcotic habits in the ancestors produced descendants in whom the normal checks on excessive nervous action were removed, so that paranoiacs, periodical lunatics, epileptics, hysterics, congenital criminals, congenital paupers or otherwise degenerable beings, result. This influence was most strongly exerted, when the maternal ancestor was the one affected for, as Spitzka had shown, to her was committed the development of the ovum prior to conception and of the child subsequently. If either was interfered with by a habit, a being, defective in some respects, was the result. In dealing with the cases reported by Dr. Earle, the

---

[101] Zambaco, D. A.—Contribution a l'étude de la morphinomanie. Encéphale. Paris. 1884. IV. pp. 658-683.

[102] Earle, F. B.—Maternal opium habit and infant mortality. Med. Standard. Chicago. 1888. III. pp. 2-4.

fact should be remembered that, as the researches of Ball, de Monteyel, Manning, Mays and those of Dr. Kiernan himself had shown, infantile mortality was very great among the neuropathic class. With regard to the direct influence of the opium habit in mothers and on the offspring, Dr. Amabile had shown the children of opium smokers were somewhat intractable to opium, but that such children were apt to die suddenly. Dr. Alonzo Calkins had reported several cases illustrating the same facts as described by Dr. Earle. Dr. Levinstein found, by experiments on pregnant dogs and rabbits, that the use of opium during pregnancy produces either abortion or still-birth, or rapidly dying off-spring. Dr. Hubbard has discussed the very question raised by Dr. Earle and said that treatment of the opium habit must be postponed until it will not imperil mother or child. He reports cases presenting the same phenomena as described by Dr. Earle in which opium was given with the result of improving the physical condition of the children, who, however, grew up stupid. Dr. Kiernan was himself acquainted with two similar cases.

"As to treatment, the habituée would abort if deprived of opium. With regard to the treatment of the child, Dr. Hubbard believed that the smallest quantity of opium necessary to sustain the child should be ascertained in these cases. The child should be allowed to regain strength after which the dose should be reduced and the same treatment pursued as in other cases of the opium habit."

T. J. Happel—1892.[103]

Happel, whose theories as to the cause of symptoms noted in infants born of mothers suffering from chronic opium intoxication have been widely quoted, in his consideration of the existence of the sexual desire and function in women using morphin, describes several cases. He concludes that when the mother uses morphin habitually, the child is born with some defect of the heart, a congenital heart disease. "I do not pretend to assert that the use of morphin is the sole cause of these defects, but that when morphin is used to excess, in the large majority of cases, the deficiencies do exist."

The author states that the symptoms are restlessness, fretfulness, and cyanosis, but that the child is generally in good condition for the first twelve to twenty-four hours. However, the condition grows worse, unless the cause of the trouble is known or suspected and the free use of opiates and stimulants is begun. Happel believes that the condition is easily understood if the fact is kept in mind that the child is born an opium user, its blood is saturated with the drug, the mother has lived on it, and the foetus has developed under it.

---

[103] Happel, T. J.—Morphinism in its relation to the sexual functions and appetite, and its effect on the off-spring of the users of the drug. Med. and Surg. Rep. 1892. LXVIII. pp. 403-407.

Bureau—1895.[104]

Bureau, in an article dealing with the chemical proof of the passage of morphin through the placenta, reports the confinement of Mme. G., age 33, in perfect health. She became pregnant in October 1887 and through severe pain in the pelvis and bladder began the use of morphin not long after and quickly reached a daily dose of eight or ten cgs. An ectopic pregnancy was diagnosed and a rupture of the cyst, with relief and ending of the pregnancy, occurred in January. By this time morphinism was established and two or three cgs. a day were used. In October 1888 pregnancy again occurred and was normally conducted until the seventh month when the urine contained a great deal of albumen. This improved on treatment and on July 20, 1889, the patient gave birth to a well-developed girl baby. The infant was fed by a wet nurse and grew and developed normally without any symptoms of narcosis or withdrawal. Meanwhile Mme. G. increased her daily amount of morphin to from 1 cg. to 1.20 cgs. a day. Menstruation continued regularly, as heretofore. In January 1893 it ceased and pregnancy developed with a great deal of bladder pain and albuminuria. She used at least 7.5 cgs. of morphin a day. Delivery took place November 19, 1893, of a normal girl baby, right posterior occiput forceps, without difficulty or injury. The baby died on the seventh day with symptoms of excessive nervousness, rapid breathing and convulsive movements. Post-mortem could not be made. She had nursed with difficulty.

In June 1894, pregnancy again took place while Mme. G. was using 1 g. of morphin daily. At about the fourth month the physician tried to reduce the dose and the patient cooperated, but complained of violent pain in the abdomen and that the foetus moved very actively when the drug was stopped. The attempt to withdraw the drug failed. Delivery occurred April 4, 1895, spontaneously after eight hours of labor. A girl baby weighing 3 kg. 750 g. The baby had a left club and a cephalic asymmetry. The left side was as if atrophied, the right side well developed. The infant was very nervous for the first week, a good wet nurse was found and at the time of writing nutrition was progressing well.

---

[104] Bureau—Accouchement d'une morphinomane; preuve chimique du passage de la morphine à travers le placenta; réflexions. Bull. et mem. Soc. obst. et gyn. de Paris. 1895. pp. 356-362.

Immediately after delivery, in this instance the cord was tied and 130 gs. of placental blood was collected. This was tested carefully for morphin which was found present as indicated by positive reactions in five different tests. The author states that the passage of morphin through the placenta is not especially surprising, but he finds no record of the fact having been previously demonstrated.

Bureau states that in 1891 Furst wrote (*Centralblatt f. Gyn.* 1891, No. 3, p. 73) an article on the use of morphin in pregnant and parturient women and nurslings. He reported two cases of infants of a mother who was taking morphin throughout pregnancy where little or no effect was observed on the health of the children.

The author calls attention to the prolongation of pregnancy, according to his calculation two weeks, in the last instance in Mme. G. due he thought to the retarding of the setting up of uterine contractions by the drug.

American Textbook of Applied Therapeutics—1896.[105]

"Infants born of mothers who are morphinists have small chances of living. Happel attributes their low vitality to a congenital defect of the heart, a non-closure of the foramen ovale and the ductus arteriosus. In such cases, convulsions, cyanosis, and most alarming collapse often supervene shortly after birth, and large doses of morphine hypodermically are necessary for relief. The child has subsequently to be weaned carefully from the poison. The possibility of morphinism as a cause, has to be borne in mind when examining an infant suffering from the symptoms noted. The ultimate prognosis as to the child's growing up is, however, bad; and this may be considered fortunate, as the moral and mental strength of these children is so far below par as to make them liable to much subsequent suffering."

T. C. Allbutt—1905.[106]

"A curious assertion has been made by Dr. Happel, that the children of morphinists often show on birth the 'symptoms of withdrawal' of the drug; that they readily become cyanotic, and need morphia and alcohol to rear them. Dr. Crothers, in the same discussion . . . . added that these children not rarely become themselves morphinists or alcoholists in after-life. It must be difficult to distinguish between such a direct and specific influence and the more general forms of neurotic inheritance. Four cases recur to my own memory; in one case the child of a morphinist father was marked only by asthma, which probably was part of a neurotic inheritance independently of the morphinism; and the children of three morphinist mothers were fairly healthy. As the use of morphine diminishes sexual desire, the children of morphinist mothers are more commonly met with than of morphinist fathers. Such children are no doubt born in poison, and need most careful feeding and management to attain a fairly healthy state (Grossman). Erlenmeyer saw a healthy child born of two inveterate morphinists; but on the other hand he reports that many such children are sickly, frail, and bloodless."

---

[105] Wilson, J. C. and A. A. Eshner—American Textbook of Applied Therapeutics. W. B. Saunders. 1896.

[106] Allbutt, T. C.—A System of Medicine. The Macmillan Co. 1905.

Alexander Lambert—1907-1920.[107] [108]

Lambert, 1907,[107] quotes Happel and in 1920 [108] writes:

"In some instances the children born of morphin-taking mothers become cyanotic twelve or twenty-four hours post partum and are restless and cannot be stilled in their crying. They seem to be suffering from lack of morphin and are blue babies. They frequently die unless they are given small doses of laudanum or some other form of opium. With this they thrive, but will continue to take a certain dosage of the narcotic to which the mother was addicted. One such patient who came under the author's care at ten years of age had from birth received small doses of laudanum. Both this child and his mother were easily cured, the child showing no different reactions, in kind or in degree, from an average child; he increased in vigor of mind and body very quickly and showed not the slightest sensation of craving for the drug."

Harrington Sainsbury—1909.[109]

"It has been established that the unborn child may acquire the habit from the mother; this is not surprising, seeing that the saturation of the parental system with morphia must involve a saturation of the system of the offspring. Such children after birth may show a restlessness and sleeplessness which resist ordinary treatment, but at once yield to a dose of morphia. No more striking object-lesson on heredity, and the directness of touch which exists between offspring and parent, could be given than this, and it is more valuable because the causal modus operandi is so on the face of things; the morphia absorbed, circulating in the blood of the parent, must by diffusion find its way into the circulation of the infant; the close contact between the two circulations of parent and offspring being adapted to this very end, intercommunication. But if this holds for one drug, opium, must it not hold for all drugs, alcohol, chloral, cocaine, etc., the activities of which depend on soluble substances?

"This, of course, is not the only way in which habit works via heredity, for the morphinist father tends to beget children whose vitality is, from the beginning, not only seriously impaired, but specifically biased. How could it be otherwise, since every influence within the body tells in the upbuilding of protoplasm, and since the composite protoplasm of the germ borrows its qualities from every form of protoplasm in the parental organism? That microcosm, the parent germ on the father's side, must therefore incorporate itself and pass on the morphia influence present at the time of its synthesis, and the difference between the maternal and paternal influences will lie in this, that the former will include, not only the last-named indirect synthetic element, but also the direct influence of the circulating poison."

---

[107] Lambert, Alexander—Osler and McCrae's "Modern Medicine." 1907.

[108] Lambert, Alexander—Nelson's Loose-Leaf Medicine. 1920.

[109] Sainsbury, Harrington—Drugs and the Drug Habit. E. P. Dutton. 1909.

C. C. Wholey—1912.[110]

"A point worth noting here is that if a woman taking morphin in large amounts bears a child, the child is apt to be seriously dependent on the drug. Having obtained it through the mother's blood, he must now have it to prevent death from heart collapse. A case came to my notice lately in which such an outcome seems without doubt to have occurred."

A. Reiche—1912.[111]

Reiche, in an article dealing with the effect on the foetus of morphin administered to a pregnant dog, says that morphin could not be detected in the foetus. He believes, therefore, that it is questionable whether the poison is, in general, transmitted by the mother to the offspring. He states that large doses of morphin can imperil the foetus, by reducing the blood pressure of the mother and by disturbing the respiration of the child shortly before birth. It is well to consider that large doses of morphin taken by the mother can injure the child. But, as to how large these doses must be we can form no opinion, from investigations which have so far been made. One observation which Prof. Langstein made shows that a human foetus can develop without injury, although the mother is a high grade morphinist. The mother took daily 0.75-1.5 g. morphin hydrochloride during pregnancy. In due time, a well-delivered child was born. It was at first nursed by a wet-nurse. Four weeks later, when it had to be taken off for some other reason, it developed a short attack of cramps. However, it developed without injury. No pathological symptoms whatsoever are for the present noticeable.

---

[110] Wholey, C. C.—Morphinism in some of its less commonly noted aspects. J. A. M. A. June 15, 1912. V. LVIII, No. 24. pp. 1855-1856.

[111] Reiche, A.—Ueber den Einfluss einer trachtigen Hundin gegebenen Morphiumgaben auf den Hundefoetus und den saugenden Hund. Ztschr. f. Kinderh. 1912. Orig. IV. pp. 542-545.

George E. Pettey—1913.[112]

Pettey mentions a number of cases of congenital opium intoxication. Among them the following quotations and cases are of interest:

> "Congenital morphinism is a rather rare condition. Comparatively few opium-using mothers conceive and fewer still of the children, born of such mothers, live beyond the third day after birth. This high mortality among the infants of such mothers is not unavoidable, but, managed as they usually are, a large majority of children born to such mothers, die on the second or third day after birth.
>
> "This is due to the fact that the child's blood and tissues are as fully saturated with the narcotic, as are those of its mother; in fact, so far as the physical elements of the addiction are concerned, the child is as much an habitué as is its mother. Severance of the placental circulation, through which the child has been receiving the narcotic, shuts off that supply, and, if the drug is not administered to the child, it suffers the shock and collapse incident to the abrupt withdrawal of opiates from an habitué."

He describes a mother with two children, one of three years and the other one year old. The mother was addicted prior to the first conception. Both children had been put on an opiate for the first three days of life and afterwards had been nursed and so obtained the drug. She had continued to nurse the first one throughout the second pregnancy and up to the time of coming to the author.

Both mother and children were treated and recovered.

The author continues:

> "Every child, born of an opium-using mother, should be given an opiate for the first three days after birth. After that the milk may be depended upon to contain enough of the drug to satisfy the demands of the child's system, or, if it is thought best not to allow the child to nurse, the administration of the opiate should be continued, until such time as the child is strong enough to stand the withdrawal. By this means their lives can be preserved.
>
> "The quantity of opiate which the child will require to relieve its distress and to bring it up to what is a normal condition, will vary according to the quantity of drug which is being taken by the mother. The child's blood is as much saturated with the narcotic as is the blood of the mother, and the nerve-centers have acquired the same proportionate degree of tolerance for the opiate, that the mother's nervous system has.
>
> "The relative size of the dose, however, will not hold good if the mother is taking more than 10 grains of morphine per day. It is not believed that the system will really appropriate more than 15 or 20 grains of morphine per day at the outside, and probably not much over 10 grains. What is taken, in excess of that

---

[112] Pettey, George E.—Narcotic Drug Diseases and Allied Ailments. Tenn. J. A. Davis Company. 1913.

amount, is really thrown off as waste and makes but little, if any, impression on the nervous system.

"A drug habitué who is taking regularly, and whose system has become accustomed to the effects of, as much as 20 grains of morphine per day, could inject almost any quantity above that with impunity. However, if the mother is taking only a few grains, or even 1 grain, of morphine daily, the child's system will be equally as toxic from its effects as that of the mother and the drug will be as much a necessity to its comfort as it is to the comfort of the mother.

"While it will not require so large a dose, for a child born to a mother who is using only a small quantity of opiates per day, the opiate is necessary to its comfort and its administration should be begun, as soon as abstinence symptoms make their appearance. It is a safe rule to begin with 1 drop of laudanum and repeat at intervals of one-half hour, until the child shows the effects of the drug, either by being put to sleep or being relieved from the distressing abstinence symptoms.

"The time that these symptoms may be expected to show themselves will depend upon the frequency with which the mother has been in the habit of taking the doses of her drugs. If the mother is taking but one dose of opiate in twenty-four hours, and the child is born a few hours after she has had her accustomed dose, of course, its blood will have in it the proportionate quantity of the opiate, and this will continue to keep the child quiet until the time, or probably a few hours beyond the time, for the succeeding dose to which the mother has been accustomed.

"But should the child be born just before the time for the mother's accustomed dose, it is evident that her blood and her system, as also that of the child, would be fairly well out from under the influence of the dose taken, say, eighteen or twenty hours, or probably twenty-three hours, before. In this case, the child would begin to suffer from the abstinence symptoms within a very short time after delivery, notwithstanding only one dose of morphine had been taken by the mother during each twenty-four hours.

"This condition should be inquired into, and, if the mother has taken her accustomed dose only a few hours before the severance of placental circulation, no opiate will be required for the child until the succeeding time for the mother's dose; then it should be given the child, as well as the mother.

"Again, the frequency with which the child will require these doses will depend upon the frequency with which the mother has been accustomed to taking the drug. The child's nerve-centers have been accustomed to the same periodic, narcotic sedation which the mother has been subjected to, and these periods have become fixed in its life to such a degree, that if the narcotic impression to which it has thus been accustomed is not kept up, the child will suffer abstinence symptoms, just as the mother would if she did not receive her accustomed dose at the time she had been taking it.

"These periods should be observed in the administration of the drug to the child, as well as the mother, as any attempt to interfere with them, at this stage, would result in serious illness of the child. When the child is two or three months old, both the child and mother may be safely taken off the drug by proper treatment, but no effort at withdrawal or even reduction of the drug should be made during the parturient month, either in the case of the child or mother.

"Mrs. M. J. came for treatment May, 1910. She had been taking McMunn's elixir of opium thirty-one years; is the mother of eighteen children; only the first two and the last one lived beyond the third day after birth. The first two children were born before she had become addicted to the opiate. During the third pregnancy she was threatened with miscarriage and McMunn's elixir of opium was given, to prevent it. During the last half of the period of gestation, the opiate was administered to her two or three times a day, and while it served the purpose of preserving the pregnancy, it also fastened the opium habit upon her and she was not able to throw it off.

"The child was fully developed and apparently perfectly healthy, but, on the day following its birth, it began to show signs of illness and it grew progressively worse and died forty-eight hours after delivery, in convulsions. Neither the physician in attendance nor the mother understood the necessity of giving the child an opiate, and none was given; the death was attributed to unknown causes.

"This pregnancy was followed by another within fifteen months, in which she was confined under the same management, with death of the child, within three days after birth, and this pregnancy by another and another, until this woman had given birth to fifteen children, while using an opiate habitually.

"All the children died within three days from their birth, most of them dying by the end of the second day. The same physician attended her in all these confinements, and both the mother and the physician looked upon the death of the children, as a natural consequence of the mother's condition and inevitable.

"In her last confinement she was attended by another physician, who appreciated the conditions under which the child was being brought into the world and understood the necessity of protecting it from the shock incident to the abrupt withdrawal of the opiate. In order to do this, he gave paregoric in 10 drop doses and these were repeated at such intervals as were found necessary to keep the child comfortable and free from abstinence symptoms.

"The child was not allowed to nurse, but the paregoric was kept up for a few months and then gradually discontinued. This child is now a stout, healthy boy of 13 years, and the mother is firm in her belief that, had the same course been pursued with her other children, they would have lived also. They were all well developed and apparently normal children and showed no signs of illness or discomfort during the first twelve hours after birth, but, from that time on, their illness grew rapidly and they either went into complete collapse or died in convulsions, by the end of the third day after birth."

P. M. Lichtenstein—1915.[113]

Lichtenstein reviews two cases of chronic opium intoxication in nursing infants, following the *post partum* development of this condition in the mothers. In this connection, he states that when the mother suffers from chronic intoxication before the birth of the child, the result will be either miscarriage, stillbirth, or the birth of a "child showing narcotic poisoning and with an inherited tendency toward taking narcotics."

---

[113] Lichtenstein, P. M.—Infant Drug Addicts. N.Y. M.J. Oct. 30, 1915.

H. A. Hare—1916.[114]

"When a mother is an opium-eater, the new-born child often suffers from collapse, on the second or third day after birth, owing to the lack of its customary dose of opium."

K. S. Howlett—1917.[115]

Howlett reports the case of a child born of parents suffering from chronic opium intoxication. As the mother had no milk, the child was fed artificially and did well from the beginning in every respect. At four years of age, the child was rosy and vigorous and had no perceptible neurotic tendency.

The author concludes that his observations would not indicate that the infant *in utero* was unfavorably affected by use of morphin by the mother.

W. A. Bastedo—1918.[116]

"Though it [morphin] is found in the fetal blood, it does not seem to affect the fetus, probably because the latter does not maintain its vitality, by its respiratory apparatus. The new-born babe of a habitué may, however, fail to breathe, or if it lives may require its habitual dose, if the amount excreted in the mother's milk is insufficient, or if the child is taken from the breast."

* * * * *

"Collapse for want of the drug has been reported, in infants born of habitués."

* * * * *

C. F. J. Laase—1919.[117]

"The mother of my patient was a woman of twenty-seven years, who had been addicted to opiates for over two years. Her general and physical condition was good. Her pregnancy was uncomplicated and uneventful. Its course was apparently uninfluenced by her addicted condition so long as opiate drug was supplied to her in the quantities necessary to maintain her free from the symptoms of opiate drug withdrawal, or body-need for opiates.

"Labor was accomplished during insufficient supply of narcotic drug, practically in a condition of withdrawal or drug-need. I had explained to her the inhibitory action of opiate, and she concluded that the opiate would slow her pains and prolong her delivery and might jeopardize the child's life. She, therefore, refused a normal supply of opiate during labor. She was in a highly excited state, when labor was finally completed, very restless, suffering from the usual distresses of opiate need, and just before the final pains attempted to jump out of the window to end the misery of combined labor pains and opiate deprivation. Labor pains were very energetic, and delivery was accomplished with little difficulty.

---

[114] Hare, H. A.—Practical Therapeutics. Lea & Febiger, 16th ed. 1916.

[115] Howlett, K. S.—Drug Addiction and Newborn. J. Tenn. M. A. Apr. 1918.

[116] Bastedo, W. A.—Materia Medica: Pharmacology: Therapeutics. W. B. Saunders Co. 2nd Ed. 1918.

[117] Laase, C. F. J.—Practical Application of the Facts of Narcotic Drug Addiction Disease. Med. Rec. Aug. 9, 1919.

"The baby was a well-nourished, healthy appearing child. From the moment of birth, however, it was very restless. This restlessness is probably to be interpreted as early opiate need, due to the insufficient amounts of opiate taken by the mother just previously. The symptoms and signs of drug-need developed in the infant identically with those of its mother, in character and in sequence. The restlessness increased; it began to yawn and sneeze. Its face became pinched and its color poor. It drew up its legs as if in cramps, and cried out as if in pain. Its pupils became widely dilated. The chin was in a constant tremor reminding the observer of the chattering of an adult in a chill. Finally diarrhoea began, and the infant showed signs of collapse, with general convulsions.

"Nothing seemed to alleviate these symptoms, until finally a drop of paregoric in water was given, using a small eye-dropper to put the paregoric in the mouth. Five drops of paregoric were given at intervals of five to ten minutes, causing a progressive subsidence of the symptoms and a return to normal."

* * * * *

"When lactation was fully established, the necessity for paregoric administration ceased. The infant apparently obtained its narcotic supply through the mother's milk. The mother nursed the child at regular intervals. Just before the time for nursing, the child would display a restlessness unlike that seen in normal children, which would subside immediately after nursing."

L. A. Van Kleek—1920.[118]

Van Kleek reports the following case of chronic opium intoxication in a new-born infant of a woman, aged 32, married 4 years, first pregnancy. She had developed the condition as a result of the use of paregoric, codein, and later morphin administered for painful menstruation.

"When she first consulted me, she was in her third month of pregnancy, and taking between four and five grains of morphine sulphate daily. Her period of pregnancy was normal save for slight vomiting and a slight trace of albumin in the urine. Labor began at term and lasted twelve hours. The delivery was normal in the left occipital posterior position. During the labor it was necessary to increase the morphine to six grains. This administration of the drug had no effect on the character or frequency of the pains. The post-partum period was normal, the milk flow being established on the fourth day.

---

[118] Van Kleek, L. A.—Symptoms of Morphine Withdrawal in an Infant. Amer. Med. Jan. 1920. pp. 51-52.

"Apparently normal male child weighing seven and one-half pounds. Cried well at birth. On the second day the child's condition became alarming without apparent cause. The pulse became weak and almost imperceptible; the skin was pale and bathed in cold perspiration; mucous membranes and extremities cyanotic; respirations rapid and shallow; vomiting and diarrhoea marked, the child presented a clinical picture of distinct surgical shock. The routine measures for the treatment of shock were tried without response. In view of the fact that the mother was addicted to the use of morphine the child was given three minims of Tincture Opium Camphorata and repeated in one-half hour for three times. The effect was almost like magic. The pulse and circulation improved, and skin became warm, the cyanosis disappeared, the vomiting and diarrhoea stopped. In fact in three or four hours the condition was very nearly normal. The condition appeared again on the third and fourth day, and at each time Tincture Opium Camphorata was given with the same results. After the milk came into the breasts, and the child began to nurse the condition did not reappear. The case was discharged from my care at the end of twenty-one days, both patients apparently well. Six months later I heard from the patient, she still continued using morphine, both she and the baby were in good health."

E. S. Bishop—1920.[119]

". . . . as to age in addicts there is no limit. I have seen an infant newly born of an addicted mother displaying the characteristic physical symptoms, signs and phenomena of body need for opiate a few hours after birth. . . . The infant undoubtedly developed addiction-disease prenatally, reacting in its unborn body against the presence of opiates, supplied through its mother's blood, exactly as is now demonstrated through experimental laboratory animals and by clinical study upon adults, this disease is always developed—through physical and constant reaction of the body, to the continued presence of opiates, however supplied. There have been many such cases, some of which are matters of medical record. This condition of prenatal development of addiction-disease exists, beyond dispute, and certainly cannot be explained upon grounds of conscious appetite or deliberate self-indulgence."

P. Sollier—1921.

In reply to a query as to the observance of chronic intoxication in the new-born, Sollier writes:

"I have not published anything on congenital morphinism but I have observed very definite cases where the new-born has shown withdrawal symptoms for several days or even died rapidly in spite of the administration of laudanum, the mother being in a state of intoxication at the time of delivery. I do not know of any special work on this important subject."

---

[119] Bishop, E. S.—The Narcotic Drug Problem. The Macmillan Co. 1920.

TABLE XI

Details of Questionnaire Replies relating to Congenital Addiction.

A—Mother and Foetus

Case No.	Length of addiction	Drug, Dose and method	Activity of foetus	Withdrawal of drug during pregnancy	Effect on foetus	Previous pregnancies and results	Pregnancies prior to addiction and results	Children born without symptoms during addiction
1.....	Unknown	Morphin and heroin 12 grs. mouth and hypo.		No		2; both died	No	No
2.....	2 years	Morphin 2 gr. by mouth	Unknown	No		No	Yes, healthy offspring	No
3.....		Not tabulated						
4.....	10 years	Morphin 10 gr. by hypo.		No		No	Yes, a healthy female child	
5.....	12 years	Morphin 15 gr. by mouth	Yes	Yes	No report	Yes, child addicted	Yes, no report	No
6.....	2 years	Heroin; dose uncertain by hypo.	Apparently	No		No	No	Case was only child
7.....		Not tabulated						
8.....	Several years	Morphin 15 gr. by hypo.	Unable to say; did not attend case at birth	No		No, one after, no drug given and baby died	No	No
9.....	6 years	Laudanum 1 to 2 oz. by mouth	No			No	No	
10....	Unknown	Morphin, dose not known; by mouth		Doubtful		Yes, result not given	Unknown	Yes, one twin brother was robust and did not crave drug
11....		Not tabulated						
12....	12 years to 15 years	Morphin 10 gr. by mouth	Yes	No		No	Yes, results good	No
13....	7 years	Morphin 12 gr. by mouth	Yes	No		Yes, normal	Yes, normal	No
14....	Unknown	Morphin 1 or 2 grs. daily by mouth	No, movements slight	No		2, both died after few weeks	No	No, all showed symptoms
15....	Many years	Morphin, dose unknown, by hypo.	Yes	No		No	No	No
16....	5 years	Morphin 6 gr. by mouth		No		No	Yes, normal	No

TABLE XI

Details of Questionnaire Replies

B—

No.	Normal labor	First symptoms when observed	Symptoms observed	Treatment used and doses of drugs	Immediate results of treatment	How long continued	Child nursed by mother	Additional narcotic given
1	Yes	24 hours	Diarrhea, convulsions, crying and muscular contractions		Baby died 28 hrs.			
2	Yes	When infant was 3 months old	Irritable, peevish, fretful, etc.	Small doses of paregoric	Allaying of symptoms	5 weeks	Yes	Yes
3								
4	Unknown	Within a few hours after birth	Same as in adult: yawnings, stretching, restlessness, etc.	Laudanum or paregoric was given	Relief of symptoms	About 2 weeks	Unknown	Yes, laudanum or paregoric
5	Yes	At birth	Restlessness	¼ gr. morphin 4 times a day by mouth. Reduced 1/12 gr. per day for 14 days, then every 2 days, the 18th day purgatives, strychnine and bromides used	Restless periods for about 3 days after withdrawal	18 days to effect reduction	No	See treatment used
6	Yes	Second day	Dyspnoea, sweating, stretching, pallor, convulsions and death on third day	Condition not recognized and no drug given				
7								
8	Yes	When 48 hrs. old	Continued crying, excessive lachrymal secretion, refused to nurse, sleepless, diarrhea	⅛ gr. q. 2 h. failed to control symptoms, then gave ½ p. r. n. Then ½ gr. every 4 hrs. daily	See preceding	Continued 10 years until present time	Yes	Yes
9	Yes	24 hours after birth	Incessant crying, very nervous, rather active	Paregoric 3/5 gr. would quiet for 3 or 4 hours	Could quiet child in no other way	About 3 weeks	At first, then on bottle	As shown
10	Not reported	Was not withdrawn	Cried all the time	None	None	None	No—bottle baby	Yes
11								

(*Continued*)
relating to Congenital Addiction
CHILD

Outcome	When and how drug withdrawn	Condition of child at birth	Condition of child during infantile addiction	Condition after addiction	Present age of child	Addiction status at present	Remarks
Death		Small, fairly nourished					
Child improved	Gradual reduction	Poorly developed	Poorly nourished	Healthy	7 years		
Drug finally discontinued		Small, thin, no fat, bones prominent, skin wrinkled, sores on body			Unknown		Was not the attending physician but saw case by request of mother, data incomplete
	In March, 1920, by gradual reduction	No report	Small, a little overweight, sluggish, mental activity below normal	See preceding	6 years	Healthy, child now in school and O.K.	
Death on 3rd day		Well nourished and no abnormalities					Addiction of mother was unknown to accoucheur
	Never withdrawn	Smaller and thinner than normal	Made usual progress, kept pace with normal children	See preceding	About 11 years	Not seen for past year	
	It seemed impossible to withdraw drug	Normal	Gradually became emaciated and lived about 3 weeks				
Cried incessantly, until morphin was given. Taken it 58 years	Not withdrawn	Weakling from birth. Twin brother though robust, lived only few weeks	Always feeble	Always feeble	58 years		"Robust" twin brother to whom opiate was not given, only lived a few weeks

TABLE XI

Details of Questionnaire Replies

B—

No.	Normal labor	First symptoms when observed	Symptoms observed	Treatment used and doses of drugs	Immediate results of treatment	How long continued	Child nursed by mother	Additional narcotic given
12	Yes	2nd or 3rd day	Nervousness, colic, crying all the time, would not nurse until "doped"	Paregoric by mouth	Relief	2 or 3 mos. until baby died	Yes	Yes
13	Yes	1½ days after birth	Breathing short, clogged nose, extreme nervousness, cyanosis of face and body	No narcotic used, withdrawn from mother, death of child in about 5 days			Yes	No
14	No, labor slow; pains weak.		Nervous, jerky, crying constantly	Large doses of paregoric. Not withdrawn	Child did well with paregoric		No, but another similar case was nursed	Yes, paregoric
15	Hard forceps delivery. Overdue from large doses of morph.	12 hours after birth	Crying, kicking, jerking	15 gr. paregoric every hr. 4 doses to quiet	Quieted down and seemed normal	Unknown	Not known	Yes
16	Yes	8 hours after birth	Restless, crying	Gave it laudanum and kept it up for 2 years	Quieted child	At 2 years mother gave it morph. until it was 12 and they both came for treatment	For few days only	Yes

Committee on Drug Addictions—1921.

In addition to the above cases from the literature, reports have been received, in replies to our questionnaires, in which the following question was asked:

"Have you observed congenital narcotic addiction in infants of mothers addicted during pregnancy?"

Of the 570 replies received to this question, 51 or about 9% replied in the affirmative, 4 correspondents stated that they were uncertain, 2 that they had heard of such cases, while 513 or 90% replied in the negative.

To those replying in the affirmative, a supplemental questionnaire,

(*Continued*)

relating to Congenital Addiction
CHILD

Outcome	When and how drug withdrawn	Condition of child at birth	Condition of child during infantile addiction	Condition after addiction	Present age of child	Addiction status at present	Remarks
Paregoric	At death of baby	Undeveloped normal child	Normal growth		Dead		
Death of child	No narcotic used, mother not able to get it, suffered much	Normal and well developed			Dead		
Mother stopped paregoric and child died after several months	Not withdrawn	Undersized, anaemic, weak—gave teaspoonful paregoric and baby got lively	Apparently perfect health—appetite and bowels normal, looked pale and underfed		Dead		Two cases to this mother. Both died about a month after she stopped paregoric, one three months and other 1 year old
Unknown	Unknown, physician left town soon after and never heard	Very large, strong and active—about 30 days overdue	Unknown	Unknown	If living would be 19 or 20 years old		Case was not followed up as physician left the town
Child addicted at 12; took 20 gr. morphin a day	At 12 years of age when mother was treated	5½ lbs. at 12: about size of 6-year-old child	Never normal in weight	Cured in 1902, now grown and well	32 years	Absolutely free	Mother was under treatment and reduced from 15 gr. to 6 grs. a day, when she became pregnant she had menstruated for the first time in 3 years

dealing with the circumstances surrounding such cases and the phenomena observed was sent. Replies, in which the information sought was given in more or less detail, were received from 13 physicians as shown in the table.

In addition to the replies tabulated, letters reporting cases of congenital opium intoxication were received from four correspondents, in which the information supplied was insufficient to permit of its tabulation.

Requests for reports of knowledge of such cases were made in a separate questionnaire to present and former heads of narcotic clinics.

To this question, 10 replies were received, 2 in the affirmative, 8 in the negative.

From these two sources, therefore, 53 correspondents have reported the observation of such cases.

C. E. Sandoz—1922.[120]

> "When a pregnant woman uses morphine, the drug circulating in her blood goes over into the child's, so that babies of morphinist mothers show, some hours after birth, withdrawal symptoms identical with those of adults and which are often so severe that they die. Furthermore, cases are on record in which morphine, habitually taken by the mother after the birth of the child, has created in the latter a condition of morphinism which manifested itself by withdrawal symptoms when feeding at the breast was discontinued."

Résumé

On the basis of the evidence submitted in the three preceding chapters two conclusions may be drawn: first, that while the evidence of profound somatic and psychic changes is clear, no theory that has sought to explain the exact nature of the phenomena observed in the various stages of chronic opium intoxication either in human beings or in animals has adduced sufficient proof to warrant its unqualified acceptance on the bases usually required for scientific demonstration; second, in view of the preceding, research work along a number of lines is needed to establish unequivocal grounds for a complete understanding of this condition. This research should include clinical—general medical, psychiatrical, neurological studies—and laboratory experimentation dealing with all phases of the pathology involved and covering a sufficiently long series of cases to warrant the drawing of general conclusions.

Practically the whole controversy relating to the handling of this problem through prevention, alleviation, cure, or ultimate abolition has arisen from different conceptions of the mechanism of the phenomena recorded. It would appear, therefore, that the establishment of accurate knowledge as to the nature of the condition involved is a matter of fundamental importance and one which should claim the first attention and effort of those who would seek upon a rational basis to assist in the problem's solution.

---

[120] Sandoz, C. E.—Report on morphinism to the Municipal Court of Boston. Jour. of Crim. Law and Criminol. May 1922. Vol. XIII. No. 1.

CHAPTER VII

SYMPTOMATOLOGY

There is but little difference of opinion among the various writers as to the symptoms which may manifest themselves during the course of chronic opium intoxication, although the cause of these symptoms, the degree of their intensity, and the constancy with which they occur are matters of dispute. Many authors claim, for instance, that individuals accustomed to the use of relatively small doses, when continuously supplied with their accustomed dose, do not show any group of symptoms which may be termed pathognomonic of the condition. A symptom very frequently described as indicative of opium use is the contracted pupil and yet a considerable number of writers state that this may or may not be present in individual cases at all times. The same exceptions are made in the case of other classical symptoms such as emaciation, dry skin, pale or sallow complexion, and digestive disturbances, which so frequently are given as characteristic. These symptoms in many instances, it is claimed, are evidence of the use of excessive doses rather than of the condition when smaller doses are employed and are observable, for the most part, only in advanced cases where great abuse, associated with insufficient food, the use of other drugs, or general unhygienic conditions, has been practiced.

A further difficulty in classifying symptoms occurs from the fact that what one writer describes as symptoms of intoxication another will attribute to beginning withdrawal. This is not surprising when we consider the wide difference in individual susceptibility and resistance as well as the marked differences in the amounts consumed daily. These differences in the ability of individuals to react and hence to obliterate what might be termed characteristic symptoms in another are just as true, apparently, in this condition as in any other toxic state and constantly must be borne in mind in an attempt to describe as characteristic any symptom-complex.

Many writers, for instance, are agreed that it would be extremely difficult, if not impossible, for even an experienced observer to diagnose a case of chronic opium intoxication in an individual in perfect "drug balance." They claim that in such cases the only certain means of arriving at a diagnosis is the segregation of the patient, the known absence of any opium product, and the consequent development of abstinence symptoms. According to Jouet,[1] Charcot was the first to call attention to this point and to its utility in diagnosing the existence of the condition in its earlier stages among patients who were themselves unconscious of any abnormal state but who, for therapeutic reasons, had been exposed to repeated opium-taking.

In view of this close blending of the so-called symptoms evident during the different periods and stages of this condition, it is impossible for us to treat them separately. We shall consider them, therefore, as manifestations of the condition as a whole from the time of its development until that of its complete eradication.

A review of the earlier descriptions of this condition in its various stages indicates that many symptoms have been well recognized and recorded by medical writers with but few, if any, changes for a long period of time. In order to avoid needless repetition we shall confine ourselves chiefly to the more recent writers whose descriptions may be considered typical of current opinion.

G. H. Smith—1842.[2]

Smith, in describing opium-smoking in China in a communication to Dr. J. Johnson, relates the technique of the operation, tells something of its extent, and describes in some detail the condition of cases observed under treatment. The communication was read before the Westminister Medical Society on Feb. 12, 1842, and refers to the abstinence symptoms as follows:

> "If the dose be not taken at the usual time, there is great prostration, vertigo, torpor, discharge of water from the eyes, and in some an involuntary discharge of semen, even when wide awake. If the privation be complete a still more formidable train of phenomena takes place. Coldness is felt over the whole body, with aching pains in all parts. Diarrhoea occurs—the most horrid feelings of wretchedness come on; and if the poison be withheld, death terminates the victim's existence."

---

[1] Jouet, D.—Étude sur le morphinisme chronique. Thèse de Paris. 1883.

[2] Smith, G. H.—On Opium Smoking among the Chinese. Communication to Dr. J. Johnson. Lancet. 1841-2. Vol. I. p. 707.

J. Pereira—1872.[3]

"The withdrawal of morphine from those accustomed to its use leads to a train of very severe effects, the severity being proportional to the rapidity with which the drug is withdrawn. Prominent throughout is an almost uncontrollable craving for the drug, passing sometimes into a true mania. Besides this, the first symptoms consist in spasmodic yawning and sneezing; coryza and lachrymation; and hoarseness. The pupils dilate again. The extremities are cold, the head congested. Headache, neuralgias, and violent pains, often in the legs. The digestion is profoundly disturbed, presenting the symptoms of a violent functional gastroenteritis. Insomnia is a very constant symptom; the patients are very irritable and excitable, and this condition may culminate in delirium or acute mania, often suicidal. Women often have hysteric attacks. The most dangerous phenomenon is sudden collapse, ushered in by rapid, irregular and weak pulse, cold sweat, and general prostration; and often ending fatally by heart-failure. This collapse, if severe, demands the prompt injection of a moderate dose of morphine, which generally causes the symptoms to disappear."

E. Levinstein—1877.[4]

Another early description of the symptomatology of chronic opium intoxication is that published in "Die Morphiumsucht" by Levinstein in 1877, though he had, in 1875, at a meeting of the *Société des Curieux de la Nature* held at Gratz in September and a month later at a meeting of the Berlin medical society, described the condition, and, for the first time, applied to it, as we have seen above, the term *morphiumsucht.* His description of the symptomatology, while not the first by any means, has become classical and is probably more extensively quoted by others writing since his day than that of any other author, possessing thus an historic importance quite aside from any other.

Levinstein subdivides this symptomatology into the manifestations of chronic morphin poisoning and those of abstinence from morphin as follows:

"I. Symptoms of Chronic Morphia Poisoning. The results arising from the abuse of morphia injections generally commence to show themselves after a period of from four to six months. There are cases, however, in which its deleterious signs only become evident after some years. The earlier or later appearance of the disorders depends upon the individual susceptibility, and not upon the larger or smaller doses of morphia administered in each case.

"Many people afflicted with morbid craving for morphia feel quite well for a certain time whilst using the narcotic; no disturbances are felt, the appetite, and even the bodily weight, remains unaltered, while others become emaciated.

---

[3] Pereira, J.—Elements of Materia Medica and Therapeutics. 1872.

[4] Levinstein, E.—Die Morphiumsucht. Translated by Charles Harrer. 1878.

Soon, however, a series of morbid appearances show themselves, originating in the cerebrospinal and sympathetic nervous system. The different organs are affected in various ways; some are not implicated at all; in others, one distinct symptom predominates over others to such an extent as to be the chief cause of the patient's complaints.

"The skin often loses its turgor, its previous colour, and its natural elasticity. The subcutaneous areolar tissue melts away, although some patients, especially ladies, retain a large quantity of fat in it. The face mostly becomes pale and ash-coloured, occasionally of a dark red hue; sometimes, however, it retains its normal colour; the perspiration frequently increases to an alarming extent. Skin diseases are rarely met with. Inflammation of the sebaceous glands, such as zoster and similar eruptions, which principally affect the chin, the cheeks and the intercostal spaces, show themselves from time to time, disappearing and returning again, in some cases to become permanent. Abscesses and infiltrations of the skin show themselves at the places where the injections have been made, extending sometimes over a large space. The patients complain of cold, and even shiverings sometimes come on.

"The eyes are often devoid of lustre, the patient's glance is weak, miserable, and shy; after administering a new injection, however, they become animated, passionate, or enthusiastic. Double vision and a diminished power of accommodation are not rarely met with.

"The pupils are generally contracted, frequently disproportionate, rarely enlarged. The mouth is generally parched, the patients complain of being thirsty, there is nausea, vomiting, dislike for meat, and want of appetite. The tongue sometimes trembles upon being shown. The bowels are mostly confined; very rarely diarrhoea sets in. The pulse in severer cases is very small, sometimes hard, but may also be thread-like. The only other symptoms observable on the part of the circulation and respiration are dyspnoea and palpitations of the heart.

"The kidneys in severe cases secrete albumin. There is dysuria, and the quantity of urine frequently diminishes. The specific gravity of the urine is rarely very high. I have seen urines of 1,004-1,038 specific gravity, and the curious fact was that the urine of a patient possessing a high specific gravity at the first examination showed the same until the end of treatment, and vice versa. It is but natural that there should have been some fluctuations, according to the quantity of urine secreted daily; but they still showed the above conditions when compared with the average quantity. The urine of people afflicted with morbid craving for morphia will nearly always reduce an alkaline solution of sulfate of copper, not precipitating it as an oxydulate. At the same time, this urine generally turns polarised light to the *left*.

"On the part of the organs of generation there is weakness, impotence, and only very rarely increased excitability.

"The menstrual discharge stops through the habitual use of morphia.

"The central nervous system will become affected in many of its functions; quarrelsomeness, want of sleep, hallucinations, changeable temper, hyperaesthesia, neuralgic complaints, paraesthesia, trembling of the hands, and increased reflex action, are the chief symptoms shown by these organs.

"II. Symptoms of Abstinence from Morphia. Although persons who suffer from morbid craving for morphia show different symptoms, some of them beginning to feel the effects of the poison after using it for several months, while others enjoy comparatively good health for years together, there is no difference between them as regards the consequences upon the partial or entire withdrawal of the narcotic drug.

"In this respect they are all equal. None of them have the power of satisfying their passions unpunished.

"Only a few hours have passed since using the last injection of morphia, and already the feeling of comfort brought on by the action of the drug is passing off. They are overcome by a feeling of uneasiness and restlessness; the feeling of self-consciousness and self-possession is gone, and is replaced by extreme despondency; a slight cough gradually brings on dyspnoea, which is increased by want of sleep and hallucinations.

"The vasomotoric system shows its weakness by abundant perspiration, by the dark colour of the face, which replaces the pale condition apparent during the first few days. Flow of blood to the head and palpitation of the heart, with a hard pulse, soon show themselves. The latter symptom often disappears suddenly, and is replaced by a slow, irregular, threadlike pulse which is a sign of the beginning of a severe collapse. The reflex irritability increases, the patients begin to sneeze and to have paroxysms of yawning; they start if any one approaches them; touching their skin causes crampy movement or convulsions; the trembling of the hands, if not already evident, now becomes distinctly perceptible. The power of speech is disordered; limping and stammering takes place. Diplopia, and disorders of the power of accommodation, frequently accompanied by increased secretion of the lachrymal glands, show themselves. The patients are overcome by a feeling of weakness and total want of energy, and are thus compelled to lie in bed.

"Neuralgic affections on various parts of the body, pain in the front and back of the head, cardialgia, abnormal sensations in the legs, associated with salivation, coryza, nausea, vomiting, and diarrhoea, tend to bring them into a desperate condition.

"Some persons will bear up with fortitude under all these trials; they will quietly remain in bed, and will endure the unavoidable suffering, hardly uttering a complaint. Of the others, although the great minority of them sleep and doze during this trying time, some can find rest nowhere; they jump out of bed, run about the room in a state of fear, crying and shrieking. Gradually they become calmer, although occasionally their excitement increases. A state of frenzy, brought on by hallucinations and illusions of all the sensory organs, at last causes a morbid condition, to which I have given the name of Delirium Tremens, resulting from morbid craving for morphia, it being similar to that caused by alcohol. Some of the patients, however, will be found walking about in deep despair, hoping to find an opportunity of freeing themselves for ever from their condition."

"The Collapse. On the second or third day after the deprivation of morphia a state of weakness in nearly all cases will supervene, due to the small quantity of food taken, during the previous time, the diarrhoea, sleeplessness, and vomiting. The pulse gets small, the face becomes pale, the patient stops in bed and has the appearance of being utterly exhausted.

"This slight collapse is of no great importance, and disappears as soon as the patient commences to take food regularly, or else it turns to a severe collapse, which is fraught with danger, and requires the greatest assiduity and care on the part of the medical attendant.

"The severe collapse may begin with premonitory symptoms, very often with a change in the voice and articulation. The patients are hoarse, they stammer or lisp when talking, there is twitching in some of the muscles of the face, and the trembling of the hands, already present, increases. The collapse may also appear suddenly at a time when the severest symptoms of abstinence, such as vomiting and diarrhoea, have passed off, and when we least expect such an occurrence. The patients while sitting in bed and talking to their attendants at once become quiet, fall back on the pillow, and sink into a state of unconsciousness, which cannot at first be overcome even by the most powerful stimulants. The face sinks in and is of a deathlike color. The nose is pointed, the eyes are bright, the pulse diminishes to 40 or 44 strokes, and the patient, after experiencing a feeling of nausea and approaching death, loses consciousness. If raised up the head falls on the chest, and no loud speaking or irritation of the skin is taken notice of. This condition may last from fifteen minutes to nearly an hour; it either recurs again three or four times during the twenty-four hours at short intervals, the patient in the meantime not entirely recovering his senses; or consciousness returns at once; or, lastly as observed by Fiedler, death ensues, accompanied by symptoms of paralysis of the brain."

D. Jouet—1883.[5]

Jouet states in regard to symptomatology that different systems and organs are affected in different individuals. In some, the nervous system suffers first and these show cerebro-spinal symptoms, excitability, changes in character, hyperesthesia of special senses, or general sensitiveness. In others, the circulatory system is most affected and there occur palpitation, pre-cordial pain, etc. In still others, but less commonly, the respiratory apparatus is affected and dyspnoea, apnoea, cough, and oppression dominate the scene.

The gastro-intestinal apparatus is most often affected. Anorexia, dyspepsia, and constipation almost always accompany chronic morphinism. These are the symptoms that lead most directly to the terminal cachexia. Finally there are cases in which the genito-urinary system is profoundly affected with albuminuria, impotence, amenorrhoea, sometimes diabetes complicating seriously the ordinary phenomena of the intoxication.

---

[5] Jouet, D.—Étude sur le morphinisme chronique. Thèse de Paris. 1883.

These variations appear to constitute so many clinical varieties.

The onset of characteristic symptoms takes place some time after the first injection; the permanent changes of the organism do not develop for from five to seven months (Levinstein). This period is very variable in different subjects and depends more on organic conditions than on the initial doses and the rapidity of their increase.

During the entire period of invasion, of the establishment of the malady, no appreciable symptoms are seen except sometimes a slight loss of weight.

L. Guinard and F. Devay—1894.[6]

In experiments on a dog covering a period of seven and one-half months these authors noted, shortly after injections of 8 cg. of morphin per day were begun, activity of the salivary glands. They state that, while in man the sweat glands are stimulated in morphinism and the other secretions including the salivary secretions are diminished, in this dog hypersalivation was noted, a fact which Calvet also observed.

Vomiting, which became automatic during the early part of the experiment, ceased when large doses, 60 cg., were reached.

During the first four months, each injection plunged the the dog into a deep sleep, but this gradually became less profound, while the animal became more and more somnolent in the intervals between the injections. In the fourth month, when doses of 60 cg. were given, alarming symptoms developed and the animal sank into a continuous torpor from which he hardly awoke for nourishment and it was necessary to return to smaller doses after about two weeks of these large doses. In the third month, sensorial troubles were noted, pupillary reflexes became less sharp, the iris remained immobile, the animal did not obey the voice and seemed completely indifferent to petting, and circulatory, respiratory, and thermic depression, which returned to normal on injection, were noted.

As to nutrition, while the dog ate well, nothing abnormal in digestive functions were noted, except for a little constipation during the first ten days. However, he lost in weight and about three months after the beginning injection he had lost 8 kilos. At the end of six and one-half months he had lost 2 more. His appearance was deplorable, emaciation was extreme and a red cell count showed only 2,300,000 per cmm. a drop of more than 2,000,000. Most authors admit that the sexual desire in man during chronic morphinism is checked, though Garnier and some others deny this. In this dog it became progressively lax and finally disappeared toward the fifth month of intoxication.

---

[6] Guinard, L. and F. Devay.—Observation d'un cas de Morphinisme chronique chez un Chien. J. de Med. vet. et Zootech. 1894. XIX. pp. 261-269.

When the morphin was abruptly withdrawn, six and one-half months after the beginning of the experiment, there was evident loss of appetite, for two or three days, the salivation continuing for five days and then disappearing. He began to eat well, but unlike human beings, he did not regain his normal weight, remaining thin. After discontinuing the injections for about two months, daily injections of 16 cg. were begun again and resulted fatally in about two weeks. Salivation returned but during the first four days he did not vomit. From the fifth day to the end, he never stopped vomiting and lost weight and appetite.

William Osler—1894.[7]

"The symptoms at first are slight, and moderate doses may be taken for months without serious injury and without disturbance of health. There are exceptional instances in which for a period of years excessive doses have been taken without deterioration of the mental or bodily functions. As a rule the dose necessary to obtain the desired sensations has gradually to be increased. As the effects wear off the victim experiences sensations of lassitude and mental depression, accompanied often with slight nausea and epigastric distress, symptoms which are relieved by another dose of the drug. The confirmed opium-eater presents a very characteristic appearance. There is a sallowness of the complexion which is almost pathognomonic, and he becomes emaciated, gray, and prematurely aged. He is restless, irritable, and unable to remain quiet for anytime. Itching is a common symptom. The sleep is disturbed, the appetite and digestion are deranged, and except when directly under the influence of the drug the mental condition is one of depression. Occasionally there are profuse sweats, which may be preceded by chills. The pupils, except when under the direct influence of the drug, are dilated sometimes unequal. Persons addicted to morphia are inveterate liars, and no reliance whatever can be placed upon their statements. In many instances this is not confined to matters relating to the vice. In women the symptoms may be associated with those of pronounced hysteria and neurasthenia. The practice may be continued for an indefinite time, usually requiring increase in the dose until ultimately enormous quantities may be needed to obtain the desired effect. Finally a condition of asthenia is induced, in which the victim takes little or no food and dies from the extreme bodily debility."

---

[7] Osler, W.—The principles and practice of Medicine. 1894.

P. Sollier—1894.[8]

Sollier compares demorphinization with the setting-up of a true experimental disease which shows a close analogy to what takes place in infectious diseases. As in the latter, the more acute the infection, the more violent the reaction of the body and the faster and more complete the elimination of the poison and also the more rapid the recovery. For this reason, Sollier prefers treatment by rapid reduction to others in that it is neither too slow to stimulate active reaction nor so abrupt as to entail unnecessary danger. A certain difference, however, exists between demorphinisation and the elimination of the poison of an infectious disease and should be borne in mind in treatment. He says:

> "While in an infectious disease, the body, attacked in the midst of health, seeks only to eliminate the poisonous principle with which it is saturated and to come out of the struggle victorious, if it is sufficiently able to resist or if the poisoning is not too intense, in morphinism, on the other hand, the body is habituated to the poison and cannot do without it, because, only by means of this poison is it able to functionate; while the phenomena of reaction are stronger in the first instance, just as the body is stronger to resist, they are also all the stronger in the second instance with a body which is weakened."

The first problem, therefore, he states, is to determine the degree of real resistance of the body when the artificial stimulation of the morphin has been removed. This determination is extremely delicate and should be carried out by exact methods and should include a careful study of the state of functional integrity of those organs which are the most indispensable to the maintenance of life and, at the same time, are most affected by the phenomena of the elimination of morphin. With this end in view, three sets of organs should be carefully examined,—the heart and circulatory apparatus, the gastro-intestinal tract, and the urinary apparatus. The other organs, although variously affected, have relatively little importance, as none of their effects is of such a nature as to put life in danger or to prevent a cure. He continues:

> "*Heart and Circulatory Apparatus.* Heart weakness is one of the most constant and serious symptoms of morphin withdrawal; this weakness is evidenced first by a slowing of the pulse, a lessening in the strength of the contractions which become irregular. The two types of irregularity which I have most fre-

---

[8] Sollier, P.—La Démorphinisation et le Traitement rationel de la Morphinomanie. Semaine Méd. 1894. pp. 146-152.

quently noted, consist of the loss of a beat in every three or four, or eight or nine. Frequently we see along with slowing, sudden acceleration of the pulse with precordial pain.

"Syncope may take place as well as serious accidents, such as collapse. The latter has not been mentioned often, except in abrupt withdrawal. Levinstein also advised a modified treatment for cases where collapse was feared, either on account of the weakness of the patient or because of a cardiac affection. In the method by rapid reduction, though syncope is possible but rare, collapse is very exceptional. In this connection, this method is not more dangerous than that by gradual withdrawal. The latter, as a matter of fact, does not eliminate syncope nor the serious accidents of abstinence. More than once I have seen proof of this in morphinists who have tried gradual withdrawal before deciding to undergo rational treatment. The heart undergoes considerable strain during the reaction of the body, set up by morphin abstinence. One appreciates, therefore, how any lesion, whether cardiac or pulmonary, causing more work for the heart, would markedly increase accidents. We also know how common, in old morphinists, is fatty degeneration and dilation of the heart due to the effect of the morphin intoxication itself."

* * * * *

"*Digestive apparatus.* All morphinists are more or less dyspeptic. Many of them do not eat and above all do not digest without taking either before or after meals an injection of morphin. We know that morphin injected under the skin quickly makes its appearance in the stomach, the mucosa of which is stimulated. It stimulates, in the same way, the intestinal glands and acts particularly on the liver which is, along with the brain, one of the organs in which morphin accumulates to the greatest degree. Also, we know that the elimination of morphin, at the time of reduction, takes place through both the stomach and intestines with great intensity through vomiting and diarrhoea. But morphin does not act on these organs only by stimulating the functions of their glands; it increases their muscular tonicity. As soon as it is withdrawn, there is set up an atony which is sometimes very marked and which is manifested by dilatation of the stomach and of the intestines. Dilatation of the stomach is extremely common, not to say constant, in morphinists. It is on this account that the too great ingestion of liquids or solids is badly borne and causes reflex phenomena of the heart and lungs which may progress to syncope. We should, therefore, determine how dilated the stomach may be, whether it still functions well and if the biliary secretion is normal, if the intestine is free before undertaking demorphinization. Although improper feeding may lead to serious consequences, at the time of withdrawal, it is however, indispensable that the patient be well fed for as Levinstein has well stated, with frequent feedings do we avoid collapse. . . ."

"*Urinary apparatus.* Although the elimination of morphin does not occur in great degree through the kidneys, it is important to determine the state of these organs on account of the circulatory troubles which might arise as a result of their affections and hamper the heart which has none too much strength to undergo the organic reactions of withdrawal. It is known that in the case of long standing morphinism, albuminuria is found. This albuminuria disappears often and appears to be due to a simple irritation of the kidneys, which, however, may also progress to a true Bright's disease. In this last case, it is necessary to be very careful, for a rather common phenomenon at the time of suppression, while there is neither abundant sweating nor vomiting, is anuria or the retention of urine, which except in such cases as Bright's disease, is almost without importance, as it is very transitory."

* * * * *

"This first point established, how is elimination carried on? Morphin acts in a particular manner on glands, and it is through these, more than through the kidneys, that elimination takes place. This fact is a matter of importance, for it explains for us, on the one hand, the vomiting, the diarrhoea and the sweats which constantly occur, and on the other hand, it shows us, that far from trying to suppress these symptoms, they must be allowed to follow their course without trying for elimination by the kidneys, which would not amount to much.

"Such is also the reason why the urine of withdrawn cases ceases to show traces of morphin as soon as the injections are stopped and it is necessary that the dose reach at least 10 cg., in order that the chemical reactions, which are complicated, be revealed in the urine.

"The symptoms set up by acute, rapid elimination of morphin, are very brief, for they only last from three to five days and their intensity varies considerably according to the length and degree of the chronic intoxication.

"These symptoms, which are what we described under the name of abstinence phenomena, consist of trembling of the legs, neuralgias, pains, sweats, alternating dilation of the pupils, diplopia, yawning, dyspnoea, cough, pain in the region of the heart, weakness of the heart, thirst, diarrhoea, vomiting, sexual stimulation, albuminuria, vesical tenesmus, suppression of urine, etc. They are too well known for me to describe them again. What I am here studying is not morphin abstinence but demorphinization, the way in which morphin is eliminated.

"In this connection, I would call attention to the eliminatory discharges following those which occur so intensely in the first days of suppression and which cause the phenomena of abstinence, which I have just mentioned.

"Westphal has already described, that at the end of eight or ten days, a new eliminatory discharge of morphin occurs, accompanied by symptoms analogous to those of suppression, but less intense and lasting for from twenty-four to thirty-six hours. This crisis is, in truth, very common and generally marks the beginning of convalescence; but it is not the only one. One of the characteristics of morphin elimination is that it occurs in spurts.

"These eliminatory crises are easy to recognize and patients may easily mistake them for illness arising from some other cause. They occur abruptly and irregularly. Suddenly, in the midst of well-established convalescence, patients are taken with weakness of the legs, circulatory disturbances after a meal (torpor, congestion of the face, etc.), loss of appetite and of sleep, at the same time that the desire for morphin returns. The tongue is a little coated, and there is diarrhoea; this is accompanied, sometimes, by bilious vomiting and lasts two or three days. Then suddenly, the lassitude disappears, the mental depression leaves, and the appetite is better than before, sleep returns and the convalescence follows its normal course.

"These crises may be repeated several times and occur even as long as two months after suppression. It is rare, however, in such cases for them to be accompanied with physical symptoms; they resemble more the short period of stimulation followed by one of general depression. The physical symptoms may even show themselves; sometimes there are one or more attacks of bilious vomiting, sometimes they consist of cardiac phenomena. I have had a striking example of this in the case of one of my confreres, who was suddenly seized the seventeenth day after withdrawal, while his convalescence was progressing splendidly, with an attack of morphin-epilepsy following which he remained in a state of semi-syncope for two days and nights, characterized by repeated stoppings of his respiration and heart and a sub-delirious state. When these symptoms disappeared, convalescence progressed with remarkable rapidity.

"Whatever the intensity of the symptoms caused by these discharges of morphin, the dangerous part is that they are always accompanied by a sudden return of morphin need and patients are never mistaken as to what they require. I have seen cases who made a definite distinction between the discomfort caused by a gastric disturbance and one which was due to morphin elimination, although both of these present analogous objective manifestations. Briefly, if the morphinist undergoes one of these crises when he is not under supervision, there is a good chance that he will have recourse to morphin, which he feels is alone able to relieve him. Therefore, it is necessary to recognize this need and it is only when one is experienced in the general attitude of morphinists that one can distinguish, as they do themselves, between the similar symptoms of these two conditions, although they are totally different in origin. It is distinctions of this kind that make the supervision of morphinists so difficult when treated at home, whence arise the frequent relapses which might easily be averted. What makes this supervision still more difficult is that there comes a time when these crises are only evidenced by a slight passing discomfort, which is unnoticed and which is always accompanied by a desire for morphin,—this is their dominating characteristic. The recognition of these crises, which I have never seen mentioned by anyone except Westphal who only speaks of the first one, is however, of capital importance, for, whatever may be the method of suppression adopted, one may not state that a morphinist is cured as long as he is still subject to them, in a however slight form.

"For how long may these eliminatory crises occur? This is a very difficult matter to state and a very delicate one too, because, when they only appear in the form of a desire for morphin, patients hesitate to admit them. However, these transient periods of morphin need reappear from time to time, according to the statements of most morphinists, for the first six months after withdrawal. They are frequently accompanied by a slight intellectual stimulation followed by depression. But they disappear, generally, entirely by the end of a year, provided always that the subject does well, does not become the victim of any other poisoning, is not subject to any painful affection, above all one of the same kind as that for which he formerly took morphin. In stating, therefore, that from six months to a year is the duration of complete elimination, which permits us no longer to fear relapse in old cases of morphinism, I believe we are within accurate limits."

James Tyson—1900.[9]

"The chief symptom is, of course, the *craving for morphin,* but it brings with it others which are more or less temporarily relieved by a dose of the drug. Among these are *irresolution* and *loss of self-control, and a moral obliquity* similar to that induced by alcohol, especially in women, who are the most frequent subjects. *Untruthfulness,* especially with regard to the drug and the quantities used, is habitual. Epigastric *pain* or *nausea,* or both, are frequently complained of toward the time when another dose is due, though whether this is actual or feigned is not always easily determined. *Mental depression* is a more constant and characteristic symptom, associated with *intense anxiety, restlessness,* and a *sense of impending evil,* both relieved for a time by the dose. All of these symptoms are increased by a more prolonged withdrawal of the drug, when the mental depression becomes intense, sometimes impelling to suicide. So far from the usual constipating effect of morphin being produced by the drug thus used, diarrhoea is not infrequent.

"As the habit is prolonged, *tremor, paresis,* and more rarely *ataxia* are superadded, while diffuse and neuralgic *pain* is complained of. *Sleep* is irregular, digestion is bad, and appetite and nutrition fail, the pulse becomes feeble and rapid, vasomotor derangements appear, as shown by a tendency to sweating and by dilatation of the pupils. Except when under the direct influence of the drug the patient grows weak and becomes a ready victim to acute disease."

E. Viguer—1903.[10]

Viguer states that when the patient is deprived of his drug he experiences an indefinable sensation, both psychic and physical, which is the state of need. No other intoxication gives rise to this state which is characteristic of morphinism. It comprises two elements, the one psychic, the other somatic, defined by Charcot as 'the vital need.'

Among the usual symptoms of withdrawal, which he gives in detail, the author stresses the choreic movements of the arms and legs, which, he says, never fail to appear and which were specially studied by Charcot who described their rhythm, extent, and kind.

T. C. Allbutt—1905.[11]

"The chief and most grievous symptom is the dangerous collapse which may follow withdrawal, and, if the withdrawal be sudden, may reach an alarming and even a fatal degree. If the drug be wholly withdrawn at the beginning, an anxious restlessness and irresistible yawnings mark the approach of the time of craving; the knee-jerks, which were deficient or even absent, become exaggerated; anesthesia gives way to hyperaesthesia; the patient begins to pace the room in a state of tremulous excitement, which becomes an agony; he springs sleepless from bed, he is shaken by rigors, sweat stands upon his skin, and saliva runs from his mouth. Feverless chills and creepiness, or sharp accesses of pyrexia often simulating ague, sneezing fits, deathly pallor, sinking, nausea and hiccup are attended or followed by vomiting and diarrhoea; the pupils widen, and are sluggish in their accommodation; speech and even gait are as if palsied; hallucinations of vision, of hearing, and even of smell, take possession of the mind, and pass into a delirium often so violent that the cautious attendant will take care that razors and garters have been removed and the windows secured. At this stage, collapse may set in, and at any moment; the physician, with his syringe charged with a small dose of morphin—say one-tenth of the accustomed dose—must not leave the patient's side for an instant. If the state becomes really alarming, the dose must be inserted; meanwhile he will do well to keep his finger upon the patient's pulse, noting any irregularity or fall in pressure and rate; in this stage, the pulse may fall as low in number as 40 or even 30 beats to the minute."

---

[9] Tyson, J.—Practice of Medicine. 1900.

[10] Viguer, E.—Contribution a l'Étude de la Démorphinisation. 1903.

[11] Allbutt, T. C.—A System of Medicine. 1905.

* * * * *

"Collapse may come on unexpectedly, even when diarrhoea has ceased; the patient becomes faint, the face pinched, and the voice hollow; the limbs may twitch; the pulse ceases at the wrist, and the signs of consciousness fail. This threatening condition may last even for an hour, or may be repeated again and again within the day. If the ordinary cordials fail to put off the danger, the injection of a small quantity of morphin must be made, lest complete collapse set in. Fortunately this remedy never fails."

M. Maguin—1909.[12]

Maguin goes into considerable detail as to the withdrawal symptoms after rehearsing the usual classical symptoms during the course of taking the drug, as follows:

1. Mental State—Abstinence causes first a vague uneasiness with nervousness towards the time of the accustomed dose. The patient is restless and complains of cold, he walks about his room, throws himself on his bed, only to get up again. Often, according to Wurtz, he has a sense of heaviness in the region of the liver. The ability to sleep disappears and insomnia becomes complete. Fortunately it lasts only for a few days. In brief, the mental symptoms of demor-

---

[12] Maguin, M.—Morphinomanie et Morphinisme. L'Écho Méd. Aug. 1, 8, 15, 1909. Vol. XIII.

phinization are due to a cerebral anemia which causes an acute attack of neurasthenia for two or three days.

Aside from this the symptoms of abstinence may be based almost entirely on three chief conditions, atony, anemia, and increase in secretions.

2. The heart becomes weak and collapse may occur. The withdrawal of the poison which is a vasodilator causes a loss of circulatory equilibrium which wears out the already tired heart. If the morphinism has produced, as often happens, a mild carditis, degeneration, and dilatation, serious accidents may take place and produce collapse, which is, however, rather uncommon. In the circulation, abstinence leads to vaso-constriction and the patient is cold, partly because the skin is covered with sweat.

3. In spite of the atony of the digestive tract, the hypersecretion is so great that an abundant mucous diarrhoea is caused. This diarrhoea, like the urine, the sweat, and the breath, gives rise to a strongly acrid and quite characteristic odor. Digestion is able to take place because of the large amount of gastric juice which is secreted and there is an increase in appetite, but after each meal a hot drink is necessary to contract the stomach. The salivary hypersecretion also aids digestion. Vomiting occurs less frequently than is stated. At all events it usually consists of mucus, rarely of food.

4. Respiration—A pulmonary anemia causes dyspnoea; the respiratory muscles are accustomed to little work and are atonic, having lost the habit of deep breathing. They replace the depth of the movement by an increased number.

5. Urinary Apparatus—Polyuria appears at once. It is often very great. The author has seen it reach twelve or fifteen quarts in twenty-four hours and it is necessary to take care lest the patient become too dehydrated. Elimination takes place in spurts. In the intervals of these spurts there is a lessening of the urine and even an anuria during which the condition of the patient becomes worse. When a new eliminatory discharge takes place with an increased amount of urine the patient is relieved. It has been said that these discharges are what aggravate the condition of the patient. The author does not think this is true. The patient's condition becomes aggravated *before the discharge* and the patient is perfectly well aware of his improvement as soon as the discharge begins. The organism which still contains a portion of the poison (not morphin as it will be seen

that it could not be morphin), forces it out into the circulation where the patient feels it being distributed; then elimination takes place.

6. The convulsive phenomena must be especially mentioned. As a rule they consist chiefly of yawning and sneezing, sometimes ten, fifteen or twenty times in a minute. It seems as though it were a nervous discharge because, after it, the patient is relieved. Less commonly, delirium with convulsions occurs.

7. Photophobia occurs with an intense irritation of the retina and with weakness of the ciliary muscles and of that of the iris.

D. Morat—1911.[13]

Morat reports the findings of a study of the secretions and blood changes occurring during chronic intoxication, withdrawal and convalescence, in a series of cases treated by Sollier's rapid detoxication method. His discussion of symptoms occurs in connection with the effect of the chronic use of the drug and withdrawal therefrom on the different organs and systems. The liver, he states, shows in about two-thirds of the cases of long-standing use of either morphin or heroin, which were examined, a lessened area of dullness indicating that the liver was smaller than normal. In other cases, this organ was either normal or had undergone a slight increase in volume. In these cases the patients had been using the drug for a relatively short time only, from six months to two years, and in small doses. These cases included only those who did not show in their history abuse of alcohol or other affections that would affect the liver. Whether small or large, however, the liver was sensitive to pressure and frequently the patients complained of a sense of weight in this region. In some cases, hepatic colic was noted. In commenting on the glycosuria described by some authors, he states that, as a matter of fact, it rarely occurs. Only two were noted among the 146 cases upon which this study was based and both of these were diabetic before the beginning of their use of opium. In detoxication by the rapid method, he states that the amount of bile produced is astonishing, reaching its maximum at the time of complete withdrawal. During this time of hyperactivity the liver usually becomes tender and symptoms of insufficiency disappear. The color of the patient improves and there is often a slight hypertrophy of the organ. The digestive tract is markedly affected by chronic intoxication, the salivary secretion is much lessened, the mouth being extremely dry. The gastric and intestinal glands suffer no less. Hunger and thirst are diminished more and more and the need of food is not felt.

---

[13] Morat, D.—Le Sang et les Sécrétions au cours de la Morphinomanie et de la Désintoxication. Thèse de Paris. 1911.

During the period of withdrawal the hypersecretion of all the digestive glands is carried to its maximum, salivation becomes intense and diarrhoea occurs profusely, due to the glandular hyperactivity which exists throughout the intestinal tract and to which is added the hyperactivity of the liver. The appetite is poor during the period of withdrawal and often the stomach will not tolerate any food at all with nausea and vomiting as prominent symptoms. In the period following withdrawal, the need of food is very rapidly experienced as is that of water.

As a general rule, there is a marked lessening of the urine during intoxication. This, Morat thinks, is largely due to the fact that the morphinist drinks little water, because, even from the time of the active purgation, the urine increases as soon as the patient is required to drink a normal quantity of liquid. In spite of the lessening of the urine, its density varies little, remaining between 1.005 and 1.030, averaging about 1.020.

It is a very common error, Morat states, to believe that morphinism causes albuminuria. Pichon, Regnier, and Sollier have already corrected this erroneous statement. In the 146 cases studied only 8 were found with albuminuria. Of these, some presented definite symptoms of Bright's disease and had the albuminuria before their beginning use of the drug and, in the history of others, there were noted illnesses frequently causing renal trouble such as scarlet fever, typhoid fever, etc. It, therefore, seems that the two causes of albuminuria mentioned by Huchard must be extremely rare; first the albuminuria of centro-bulbar origin which would be transitory, second, that of cardiac origin through hypotension.

During the period of suppression the secretion of urine is much affected. During the first two days there is a marked oliguria. This urine is highly colored and contains much phosphates and urates which persist often until the eighth day after withdrawal and recur again from time to time during convalescence. During the first hours following the last dose, it is rare to encounter albumen in the urine. But about the fifteenth hour generally the patient complains of a pain which becomes more and more severe in the kidney region. With the appearance of this pain, the oliguria becomes more marked and there is sometimes a complete temporary anuria lasting only a few hours. At this time the urine always contains albumen, the quantity varying from .5 to 1.5 g. per litre; but often much larger quantities are seen, in one case 30 g. per litre. This production of albumen consists almost entirely of serum and only lasts a few days. The kidney pain quickly subsides, the quantity of urine increases each day, and frequently there develops a true polyuria. About the eighth day after withdrawal no albumen is found.

A microscopic examination of the sediment during the period of withdrawal shows many organic elements—casts and different varieties of cells as follows:

1. The casts are granular or cellulo-granular. Hyaline or colloid casts are not found nor are blood casts. The cells found in the casts are polyhedral mononuclears which have been desquamated from the uriniferous tubes and in greater numbers irregular cells in which the protoplasm is destroyed often entirely and the nuclei of which stain with greater intensity than the nuclei of the former. These nuclei are multilobular, presenting the appearance of polynuclear cells in process of destruction.

2. The different varieties of cells scattered throughout the urine are large polyhedral vesical cells, easy to recognize; the smaller cells of the uriniferous tubules sometimes are in groups of two or three and even more with typical nuclei which stain well; finally there are smaller and irregular elements presenting often a protoplasm that is scarcely visible, nuclei deeply colored, multilobular, twisted and often torn, showing the characteristics of altered polynuclears.

Within a few days, the casts quickly disappear, then little by little, the cells, and toward the tenth day after withdrawal, it is necessary to centrifuge in order to find any organic elements.

As a general rule, the sweat glands are diminished in their activity during the chronic use of the drug. After withdrawal, they react like all other glands with a hypersecretion. So marked is this that it was necessary, in one case, to change the night clothes five or six times each night during a period of a week. These crises end quickly but from time to time during convalescence, recurrent crises give indications of this overactivity of the glands.

Although the sexual activity is inhibited, as a rule, in morphinists, the author has observed a number of cases where there was no alteration of this function. The same is true of the cessation of menstruation in women; usually it is absent but not always. The return of sexual activity in these cases is given by some authors as a definite sign of cure, but this is not reliable as menstruation may return during reduction while the daily dose is still considerable. In men, at the height of the period of detoxication, the spermatozoa do not seem to be abnormal either in number or motility and, he states, he has never seen the atrophy of the glands described by Levinstein as due to the intoxication. About ten or fifteen days after withdrawal, the sexual functions return in male patients. The inhibition of these functions is part of the profound inhibition that morphin exercises over the whole organism.

F. McK. Bell—1911.[14]

"After about six months' use of the drug some of the characteristic symptoms develop. The memory becomes treacherous, the patient may be able to recall events which have occurred years before and yet the immediate or quite recent past remains a blank, amnesia becomes marked. During a conversation words fail to come and embarrassment and confusion ensue. Insomnia gradually becomes more pronounced, for, contrary to what we might expect, the morphine habitué does not sleep well; the nights are spent in restless tossing about or for want of a better occupation in reading. Or if by chance he should fall asleep he is obsessed by the most frightful nightmare; grotesque and hideous objects flit before his harassed imagination, he hears gruesome sounds and starts from his clammy pillow into wakefulness—only a degree less terrible than those phantoms of his dreams. When the morning breaks he is exhausted but sleepless, he is fatigued, stupid, and ill-humored. A feeling of despondency oppresses him and this sensation predominates throughout the day or it is replaced at times by flashes of unwonted animation superinduced by the drug—fleeting and transitory brilliancy in which the ideas are exaggerated and unnatural—a lightninglike elimination of the mind fast followed by impenetrable darkness. There is a great tendency to fall asleep during the day time and at the most unseasonable hours and occasions, as for instance in the middle of a conversation. The will-power is enfeebled, whole days are often spent in bed, the patient lacking the initiative necessary to arise and tend to pressing duties. The sense of responsibility is obtunded, and is replaced by indifference and perfect egotism. The inability for consecutive mental work develops, and added to this we find a moral inertia; he becomes untruthful, unreliable and unethical. Criticism of all kinds is resented. His self-sufficiency recognizes no other authority. He shuns society or acts in a strange incomprehensible manner when in company. One patient whose attention I attracted to the fact that he often left my questions unanswered replied that although he heard distinctly he saw no good reason why he should use the necessary mental effort to answer them. This almost incredible indifference to opinions and feelings of others is characteristic of the disease, and the morphine habitué is bound sooner or later to become a social outcast."

---

[14] Bell, F. McK.—Morphinism and Morphinomania. New York Med. Jour. 1911. Vol. 93. pp. 680-682.

* * * * *

"Nor do we find that the mental and moral health are alone in the process of degeneration; perhaps the physical health deteriorates to an even greater extent. We find in most cases fatty degeneration of the heart and liver, an anæmia which soon is manifested by the ashy or leaden pallor so well known to most of us. Nutrition suffers and the patients become thin or flabby. The pupils are small and react slowly to light. There is thirst, loss of appetite, or an appetite only stimulated by an *ante cibum* hypodermic of morphine.

"Systematic disorders supervene and we find tremors, gastric disorders, generalized pains, cough and diarrhoea, all these symptoms being relieved by resorting to the drug. As a matter of fact all the functions of the body which normally take place in a painless manner have become so subdued by the opiate that when it is temporarily discontinued these physiologic actions become a source of positive discomfort, if not of actual pain."

* * * * *

"If the drug is suddenly withdrawn we find the most violent symptoms of reaction: restlessness, sleeplessness, pain, vomiting, diarrhoea, coryza, yawning, sneezing, coughing, palpitation of the heart, sweating, great prostration, dilated pupils, tremors, collapse and even death.

"If the pulse becomes weak, slow and irregular, the face pallid and shrunken, watch for collapse and administer, not strychnine or other so-called cardiac stimulants, but morphine in small doses. In these cases it acts as a much better and quicker stimulant than any other drug."

E. Kraepelin—1913.[15]

"Little as the symptoms of disease at first strike the eye in prolonged use of morphine, the whole malady has the most serious results for those whom it attacks. So far, all we know from experiments about the psychical effect of morphine is that apparently it makes the course of thought easier, but renders the carrying-out of the impulses of volition more difficult, and so disables the will. This last effect also becomes clinically prominent in the picture of chronic morphinism. The patients become flabby, and lose their power of action, their endurance, and their pleasure in work, and are thus most severely injured in their whole activity in life. To this must be added the continual alteration between the mentally exciting effect of the individual doses of morphine and the phenomena of deprivation, which set in after a few hours, and consist of painful inward restlessness and feelings of anxiety, and also of yawning, sneezing, diarrhoea, sweating, palpitation of the heart, and many other tormenting sensations, which drive the sufferer headlong to fresh use of the poison. Finally, there regularly appears an exaggerated sensibility to all kinds of pain and mental shock, inducing the sufferers to have recourse to injections for comparatively very trivial causes. In this way, the morphine unfailingly becomes the central point of the patient's whole interest in life, to which all other considerations are subordinated, and an absolutely slavish dependence on the remedy develops, which is proof of an infirmity of the will. With this are associated sleeplessness, defective nutrition, diminution of the physical power of resistance, and exhaustion of sexual ability."

---

[15] Kraepelin, E.—Lectures on Clinical Psychiatry. Authorized translation from the 2nd German ed., revised and edited by Thomas Johnstone. 1913.

E. S. Bishop—1913.[16]

"After addiction is once established, failure to administer the drug causes a chain of definite symptoms, varying in priority of onset, in sequence and in relative violence of manifestation in different cases. In a general way, they may be said to begin with a vague uneasiness and restlessness and sense of depression; followed by yawning, sneezing, excessive mucous secretion, nausea, uncontrolled vomiting and purging, twitching and jerking to violent jactitation, intense muscular cramps and pains, abdominal distress, marked cardiac and circulatory insufficiency and irregularity, pulse going from extremes of slowness to extremes of rapidity with loss of tone, facies drawn and haggard, pallor deepening to grayness, exhaustion, collapse and, in some cases, death."

Elsewhere he reminds us that:

"One of the obstacles to an appreciation of narcotic drug addiction-disease has been the casual assumption on the part of the average person, both lay and scientific, that opiate drugs act upon the addict, and that he reacts to them similarly to the actions and reactions in the non-addicted individual. Morphine action, however, as commonly observed following therapeutic administration or in experimentation upon unaddicted animals gives no conception of its manifestations in the man or woman grown tolerant to its use. Many of the actions and reactions of opiate upon the unaddicted are practically lost in the addicted, and absolutely new reactions, unfound in the unaddicted individual, become the dominating factors in the opiate medication of the addict."

G. E. Pettey—1913.[17]

Pettey describes the effect of opium in delaying secretion and excretion and its rôle in the consequent storing up of toxic products as follows:

"These waste products play a much more important rôle in causing the difficult complications met upon the withdrawal of morphine, known as abstinence symptoms, than does the drug itself. After the use of the drug is kept up for a time, upon examination of the patient, we find the skin dry and crusty, the tongue coated, breath foul, bowels habitually constipated, digestion impaired, heart action defective, and other evidences of portal engorgement.

---

[16] Bishop, E. S.—Narcotic Addiction—A Systemic Disease Condition, J. A. M. A. Feb. 8, 1913. Vol. LX. pp. 431-434.

[17] Pettey, G. E.—Narcotic Drug Diseases and Allied Ailments. 1913.

"When the administration of the drug is discontinued and the patient is allowed to go for a time without it, some of these symptoms give way to others of a different character, while others of them are merely intensified, but not changed in character. The dry skin gives way to excessive sweating, the constipation to diarrhoea, colic, nausea, and other evidence of gastro-intestinal disorder. With this clinical picture before us, we could arrive at no other conclusion but that the patient's system was intensely saturated with toxins of intestinal and auto-origin."

* * * * *

"Among the early symptoms incident to the withdrawal is a slight rising of temperature and as the hours following the withdrawal of the drug pass this temperature rise increases, and if left uncontrolled will run to very high degrees."

* * * * *

"From a grosser anatomical standpoint, no structural lesions result from the prolonged use of opiates, but a careful physical examination reveals unmistakable evidence of the most widespread functional derangements; the blood is thin and deficient in the oxygen-carrying red corpuscles; the mucous membranes are pale,—in fact, all the structures show signs of profound anemia; the abdomen is full and unduly indurated; the liver is enlarged and the portal system engorged; tongue coated; breath foul; skin alternately dry or excessively active, but always swarthy and yellow; heart action variable, depending upon the stage of narcotic impression; nervous reflexes either blasted or exaggerated; the muscles are flabby and relaxed; the memory is impaired; mind inactive, and the entire bearing of the patient is one of dejection and hopelessness. To sum up, the evidence clearly indicated a condition of intense intoxication with profound anemia, attended by derangement of the nervous system and impaired mentality."

The author speculates as to the cause of the fever that accompanies withdrawal as follows:

"Another symptom which is unavoidable is a slight rise of temperature, especially during the afternoon of each day. The author has taken much pains to determine the cause of that symptom, but is uncertain yet as to which of three or four factors is most potent in its causation. This fever appears in practically every case and continues sometimes as long as four weeks after the entire withdrawal of the drug.

"In the opinion of the author any one of several conditions that are evidently present might account for the fever. We have just seen that the condition of the nervous system is one of general hyperesthesia. In this condition, it is likely that the heat-centers are so disturbed that there is a loss of balance between the rate of heat production and heat radiation, thus allowing an expression of hyperpyrexia.

"Then, again, the nervous system, in fact the whole organism, has become accustomed to doing its work under the restraint of the opiate. This restraint being withdrawn, it is likely that all the vital functions would be carried on at a more active rate than normal, the nerve-centers being hypersensitive. This would doubtless lead to the greater than normal production of heat.

"Again the system is usually anemic and there is a great demand for nourishment. This being taken, there is increased activity of the digestive process. The increased oxidation incident to this increased metabolism involves increased heat production. If the nerve-centers are disturbed so that the radiation of heat is imperfectly adjusted to heat production, it is evident that there would be hyperpyrexia from more active metabolism.

"But more likely than either of these is that there remains a residue of toxic matter in the system—in the ultimate cell—which the most persistent and thorough elimination cannot remove at once, and that the fever is due to the effects of this remnant of toxic matter upon the hypersensitive nervous system.

"While the bowel may have been thoroughly emptied and the kidneys and skin made to do their full duty, or even more, it would be practically impossible to perfectly cleanse the system of such an accumulation of toxic matter in a few days, or even a week or more time. Therefore, it is probable that there would remain stored away in the tissues in the very structure of the cells a residue of toxic matter, and that this would act as an exciting cause of the fever.

"The nerve centers, being hypersensitive, would respond with undue activity to this toxic matter.

"Then, again with this hypersensitive state of the nerve-centers the slightest absorption of toxin from the intestines would result in an acute intestinal toxemia which would be attended by some fever, and this doubtless is its source in some cases.

"But, whatever may be the correct explanation of its cause, it is present and when left uncontrolled greatly increases the discomfort of the patient during convalescence. The more perfectly the system has been cleaned of toxic matter, the less fever will follow the withdrawal of the drug and the less pain there will be during the period of convalescence. Therefore, the author is inclined to be satisfied with the idea that this fever is of toxic origin."

A. Valenti—1914.[18]

Valenti, 1914, in reports on a series of experiments dealing with disturbances of the circulation brought about by the injection of the serum taken from morphinized dogs in normal animals, states that when morphin is withdrawn from morphinized dogs acute disturbances of the circulation are observed, severe arrhythmia, intense acceleration of the pulse, and violent fluctuation in blood pressure. These disturbances subside when morphin is again given and disappear entirely as the usual daily dose is reached.

---

[18] Valenti, A.—Experimentelle Untersuchungen uber den chronischen Morphinismus; Kreislaufstörungen hervorgerufen durch das Serum morphinistischer Tiere in der Abstinenzperiode. Arch. f. exp. Path. u. Pharm. 1914. Vol. 75. pp. 437-462.

A. Lambert—1914-1924.[19] [20]

"Considering the symptoms, memory is one of the faculties first affected and the amnesia is similar to the beginning senile dementia. Names are the first to go; the morphinist will relate occurrences early in his life, but will forget what he had done during the past week. He will forget the familiar names of streets, the details of his profession; thus the physician forgets the dosage of medicines and the scientific terms with which he is familiar. Amnesia of the well-marked stage of morphine intoxication is only equalled by the amnesia of paresis. The will power is enfeebled and the patients spend days in bed without sleeping and without stupor; their minds are perfectly clear but their power to do is gone. In some patients this is continuous and permanent; in others it seems to run in crises, lasting over two or three days. There is psychic asthenia. The sense of responsibility is wiped out and is replaced by the indifference of perfect egotism. Their character is modified and they are discontented grumblers, obstinately 'ugly,' ofter given to explosions of intense rage, quarreling without cause, and even destructive and dangerous to those with whom they come in contact. Often the morphinists are individuals of more than average ability and intelligence, realizing fully their condition, and appreciating their progressive degeneration. It is for this reason that they resent criticism and accept reproaches about their habit with bad grace, because they are already filled with remorse. Morphinists usually lie about their addiction because in the early stages they feel that others consider it a vice and a disgrace, however innocently it may have been acquired, and they have enough moral sense left to endeavor to hide it. If, however, they have just taken their morphine or are assured a sufficient dosage to keep them comfortable, they do not necessarily lie about other matters. The fear of being deprived of their drug is an ever-present horror. Patients have come under the writer's notice who were literally starving to death and yet have had means kept to procure the necessary amount of morphine to prevent them going through the horrors of forced withdrawal without assistance. When the craving for the drug is upon them, there is nothing to which they will not stoop to obtain it. Lying, thieving, begging in the street, prostitution itself, are to them all justifiable means to obtain the drug.

"Morphinists do not sleep well; they are subject to nocturnal hallucinations which render their nights times of terror; thus they endeavor to keep themselves awake by reading, and during the daytime are prone to fall asleep whenever they remain quiet, sitting in a chair, no matter in what place or company. The hallucinations of sight are always terrifying, and contrary to the hallucinations of alcohol, those of morphinism are not occupation deliriums. The hallucinations of sight are the most frequent; next those of hearing; those of taste and smell are rare, and those of general sensibility are exceptional, which last is always contrary to what occurs in alcoholism. The sense of taste is often dulled and sometimes even abolished. Reading and writing become impossible because pages appear clouded and deformed, and when the endeavor is made to fix a page, it dances or trembles or approaches or retrogrades, and this, together with a frequent distinct photophobia, causes great distress. Ophthalmoscopic examination does not reveal any distinct lesion. There is at times contraction, and at times dilatation of the pupils; an anemia of the retina has been described. The visual disturbances disappear when the morphine is permanently withdrawn. The reflexes are very variable. Disturbances of the general sensibility are often marked and vary greatly; there are often paresthesias and sometimes intense neuralgic pain. Others show marked anesthesia, which may be confined to one side of the body. More often there is hyperesthesia, and the sole of the foot becomes so painful, that, when it is touched to the floor, it gives a sensation of burning, and the patient can only walk with short, jumping steps. Rodet considers this form of hyperesthesia as very characteristic of chronic morphinism. The tactile sensibility is usually diminished or abolished. The question often arises whether indulgence in morphine impels the individual to suicide. At times when, inadvertently, too large a dose is taken, the patient succumbs, but as long as he can obtain his drug, he is an individual without will, apathetic, and incapable of making sufficient exertion to commit suicide; if, however, the morphine be withdrawn or he cannot obtain it, the condition entirely changes.

---

[19] Lambert, A.—Chapter in Osler and McCrae's Modern Medicine. 1914.

[20] Lambert, A.—Chapter in Nelson's Loose-leaf Medicine. 1920.

"Troubles of digestion are common; in the early stages there is nausea, vomiting and anorexia, which do not persist for a very long time. There is often an intense thirst; the breath is very offensive and of a peculiar odor, often spoken of as being so characteristic as to designate the morphinists by those who are brought in contact with many of these patients. They are markedly constipated and this often alternates with attacks of diarrhoea; their stools are bloody and, during the period of constipation, may be as infrequent as once or twice a month. The teeth are subject to caries, which attacks first the molars on their grinding surfaces; this extends to bicuspids, then to incisors, and last of all to the canines. This is always painless, not accompanied by any periostitis, and usually progresses with great rapidity. It usually coincides with the falling out of the hair. The disturbances of nutrition appear in some patients after a few months and in others not until after some years. Emaciation is perhaps the most striking and may go on to an extreme degree. Their faces become livid and often sallow, the expression set and there are premature wrinkles, which, with the faded sallow look of the skin, often gives a look of premature old age. The tissues lose their vitality, which accounts in a measure for the ease with which slight bruises cause ecchymosis, and the greater liability to the occurrences of abscesses.

"The pulse of the chronic morphinist is slow and there is a fall in arterial tension with, in the last stages, distinct enfeeblement of the heart action and diminution in the force. The number of respirations is slowed and, at times, they are shorter so that every now and then a long deep inspiration seems necessary to give the required amount of air. Dyspnoea on exertion, even if the slightest kind, is quite common. In the beginning of morphine addiction there is polyuria, which later is followed by a diminution of secretion below the normal. In many there is albuminuria which is ascribed by Levenstein to a special action of morphine on the medulla, to changes in the arterial pressure, or to a paralysis of the nerves which enter the kidney around the renal artery.

The effects in the genito-urinary system are much the same as those described under opium.

"Most women become sterile, but in spite of the cessation of menstruation, conception may take place. Pregnancy may run its normal course, or the morphine may cause a miscarriage or premature birth. Children born of morphinist mothers may be well formed and normally healthy. Often the children of morphinist parents are idiotic or show a lack of mental and physical development."

* * * * *

"The symptoms of abstinence and the sudden cessation of opium smoking are the same in most respects as follow the withdrawal of others forms of opium, but the smoker often suffers less severely and for a shorter time. The respiratory tract and the eyes are affected out of proportion to the rest of the body. The first symptoms are gaping, yawning, sneezing, profuse discharge of tears and mucus from the eyes and nose, irregularity of the pupils, ringing in the ears, followed by extreme restlessness, intense pain in the joints, nausea, vomiting and purging. A peculiar dull, drawing, dry and burning ache in the pharynx and larynx occurs, which is followed by distressing pains in the muscles, especially in the calves of the legs and between the shoulders. Chills, followed by flashes of heat are felt along the spine and are followed by profuse perspiration. In some cases, if no opiate is used, the vomiting and diarrhoea continue and the restlessness and flushed face give place to complete relaxation, a ghastly pallor with sunken eye, collapse, and death; but in less severe cases or when proper remedies are used, the distressing or dangerous symptoms cease one by one. Sleeplessness persists for a long time; the bronchitis and catarrhal inflammations of the throat usually last for months; the pains in the legs and body gradually disappear; the sexual power returns; the appetite gradually improves and becomes ravenous; an increase in the weight is manifested; a return to natural buoyancy of mind begins, and the patient regains his health and strength."

"When morphine is cut off abruptly there is great danger of collapse. This may supervene on the second or third day, and the patient shows increased weakness, appears pinched and haggard, while the pulse becomes small and then disappears. Or he may show a sudden high pulse tension, feebleness of the heart action and suddenly, while wandering about restlessly, fall pulseless to the floor. Sometimes the fatal collapse may occur without warning while the patient is quiet. Still another form of collapse may occur; the face becomes deep red, the eyes shine brilliantly, the pulse falls to forty and the patient loses consciousness after a feeling of intense agony. These collapses may last for fifteen or twenty minutes; they may recur three or four times in the twenty-four hours and the patient may recover or die in any of them unless morphine be given. Fortunately these attacks are rare when the drug is withdrawn gradually but they are fairly common when this is done abruptly. There are some few cases on record in which the fatal collapse occurred some time after the patient was convalescent and apparently well on the road to recovery. During their periods of suffering, the patients are apt to be afflicted with distressing insomnia, and, if they sleep, it is only in fitful dozes. In a longer or shorter time the suffering gradually subsides and the patient can rest with some degree of comfort; the morbid craving has gone; the appetite returns and often becomes excessive; in women menstruation is reestablished at first painfully, later normally. In both sexes the sexual desire returns, often painfully and excessively and then subsidies. The patient goes into a rapid convalescence. When morphine is broken off, if it has been taken to quiet some neuralgia or to benumb some unbearable sensation, these pains, although quiescent during the period of the addiction, may return in full force when the habit is broken."

Further, in Nelson's Loose-Leaf Medicine, 1920, he states:

"Those who see chiefly heroin addicts sometimes have doubts about the sudden collapse from morphin. Before heroin was used, however, it was realized that the sudden withdrawal of morphin sometimes brought about collapse and that death might ensue; in fact, this was not an infrequent occurrence. The deprivation of the heroin addict does not produce this same collapse. With the old-fashioned method of depriving a patient completely in two or three days, there was always the danger of a vasomotor and cardiac collapse in which the pulse would suddenly disappear; or the patient might show a sudden high tension and fulness of the pulse and suddenly while wandering about restlessly, fall pulseless to the floor."

A. Church and F. Peterson—1914.[21]

Church and Peterson list the symptoms as follows:

"1. Anorexia and constipation (later, diarrhoea often).

2. Cachectic anemia.

3. Cardiac weakness and intermittence and bradycardia.

4. Muscular weakness with tremor.

5. Miosis in the early stages, mydriasis later, with sluggish reaction of the pupils.

6. Impotence. Amenorrhoea in women.

7. The knee-jerks are often absent.

8. Diminished sensibility to touch and pain, and concentric limitation of the visual field.

9. Headaches and localized shooting pains, neuralgia, and paresthesias.

10. Sensation of feeling cold."

The psychic symptoms may be summarized briefly as:

"1. Simple elementary illusions and hallucinations, muscae volitantes, tinnitus aurium.

2. Loss of will and esthetic sense, irritability; moral perversion, as in alcoholic psychic degeneration, but with little failure of memory.

3. Diminished attention, incoherence of ideas, and easily fatigued intellectual powers. A well-developed psychosis is usually the result of abstinence from morphin, and not of the chronic misuse of it. It varies in degree up to a type approaching acute mania."

---

[21] Church, A. and F. Peterson—Nervous and Mental Diseases. 1914.

J. Rogues de Fursac and A. J. Rosanoff—1916.[22]

"According to Chambard four periods may be distinguished in the career of a morphinomaniac, which succeed each other by imperceptible transitions.

"First period: initiation or euphoria.—It has been aptly called the honeymoon of the morphinomaniac. Under the influence of the morphine physical pains, if they exist, disappear or become abated, the organic functions become more active and the mind lapses into a pleasant reverie; ideas form themselves without any effort and combine 'to form ingenious conceptions, elaborate resolutions, vast projects which, alas, are never likely to last through the day,' depressing thoughts disappear and life assumes a smiling aspect."

* * * * *

"Second period: hesitation—Many subjects, conscious of their danger, make efforts to escape from it. They diminish the doses, reduce the number of injections, etc. Some even completely discontinue the use of the drug permanently or temporarily.

"The period of hesitation is not constantly present; many patients by reason of their ignorance or lack of determination pass directly from the first period to the third.

"Third period: morphinomania proper.—The poison has now impressed its stamp upon the organism and has established certain permanent symptoms. Moreover, its suppression gives rise to a series of characteristic phenomena, the symptoms of abstinence.

"(A) *Permanent symptoms.*—(a) *Psychic phenomena.*—These consist in a general weakening of psychic activity, and are manifested in the intellectual sphere by sluggishness of association and impairment of attention contrasting with intact orientation and perfect lucidity, and by retrograde amnesia of reproduction; representations are in some way inhibited but not destroyed.

"In the emotional sphere there are indifference and atrophy of the moral sense. All the aspirations of the patient reduce themselves to a single idea, that of procuring morphine by any possible means; disregard for conventionalities, swindling, falsehoods, violence, all seem to him permissible. Many morphinomaniacs obtain their morphine from the druggist on false prescriptions, others sell their household articles to purchase morphine for the money.

"In the sphere of the reactions there is always very marked aboulia. The patient is conscious of the ruinous results of his inactivity, but has not the power to overcome it. This symptom appears early and together with the indifference forms a characteristic feature of the mental state in morphinomania.

"(b) *Physical symptoms.*—The *general nutrition* always suffers: loss of flesh, pallor of the skin, etc.

"The *circulatory apparatus* shows general atony. The cardiac impulse is weak; the peripheral circulation is sluggish; there are transient oedemas.

"The *temperature* is often subnormal. A case of morphine fever has, however, been reported. (Levinstein.)

"*Motility*: general muscular asthenia; a tendency to fatigue; tremors; 'slow, regular oscillations resulting from a twisting movement of the limb upon itself.'[23]

---

[22] Rogues de Fursac J., and A. J. Rosanoff—Manual of Psychiatry. 1916.

"*Sensibility*: slight hyperaesthesia which is at times unilateral; diminution of the acuteness of vision, often dependent upon 'pallor of the optic disc, which may advance to atrophy.'[24]

"The *pupils* are frequently myotic.

"The *tendon reflexes* are occasionally diminished.

"(B) *Symptoms of abstinence.*—When the hour for his injection has passed the morphinomaniac becomes restless, his expression becomes anxious and his respirations accelerated. A state of *anxiety* soon appears, accompanied by a very marked inhibition of all the psychic functions. The patient abandons his unfinished work or conversation and leaves, complaining that he is unable to bear the tortures of which he is a victim. At the same time there is the appearance of the pathognomonic *somatic symptoms:* extreme pallor of the face, acceleration and weakening of the pulse, general prostration, cold sweats, and spells of yawning. If abstinence continues the condition may become alarming: obstinate diarrhoea appears and collapse is threatened.

"No matter how grave the symptoms become an injection of morphine always affords instantaneous relief.

"Occasionally the mental symptoms present all the features of a veritable acute psychosis: agitation, anxiety, persecutory ideas, psycho-sensory disorders, excitement simulating that of mania; these may be associated with hysteriform or epileptiform attacks.

"Fourth period: cachexia.—The symptoms of the preceding period become more marked. The psychic disaggregation in some cases resembles true dementia. The craving for the drug is greater than ever. Loss of flesh reduces the patient almost to a skeleton; the stomach rejects all food and a permanent and intractable diarrhoea sets in; the blood pressure becomes low, the cardiac impulse grows weaker and weaker, the pulse becomes small, thready and irregular; renal changes, which are frequent, give rise to albuminuria.

"Numerous complications are apt to appear, rendering the prognosis still more serious; pulmonary tuberculosis, furunculosis, phlegmons hasten the fatal termination, which occurs at the end of the fourth period."

J. McIver and G. E. Price—1916.[25]

These authors state that most of their observations of symptoms were confined to those following withdrawal of the drug, as treatment was instituted promptly on admission of the patient.

"Those were observed to some extent in every case and we will here merely enumerate the various symptoms presented: yawning, sneezing, and lacrimation, early and later insomnia, nervousness, restlessness, anorexia, nausea, vomiting, pain in the abdomen and lower extremities, diarrhoea, profuse perspiration, tachycardia, nocturnal emissions, marked asthenia, weak pulse and collapse. There was no rise of temperature except with complications. In a few cases the temperature was subnormal."

---

[23] Jouet. Quoted by Chambard. loc. cit.

[24] Pichon. Le morphinisme. 1890.

[25] McIver, J. and G. E. Price—Drug Addiction, Analysis of one hundred and forty-seven Cases in the Philadelphia General Hospital. J. A. M. A. Feb. 12, 1916.

F. X. Dercum—1917.[26]

"Restlessness may become very marked and is always accompanied by a more or less marked insomnia. The patient is apt also to yawn or to sneeze a great deal. Often he complains of having caught cold, or perhaps he has an attack of difficult respiration simulating asthma. At times all the symptoms of a frank attack of cold in the head or a troublesome cough make their appearance. In addition, the patient complains of a sense of oppression, is distressed and frightened, becomes fault-finding and resistant and declares himself dissatisfied with the treatment.

"The restlessness may become extreme; involuntary movements of the legs and arms make their appearance, the limbs being thrown about the bed; at other times distinct involuntary jerkings and tremor make their appearance. Sometimes there is palpitation of the heart or a sense of fluttering in the precordia. Vesical tenesmus also may be noted.

"If the patient has been in the habit of taking large amounts of morphin daily and the withdrawal has been abrupt and complete, a sense of great weakness and fatigue supervenes; the patient is soon unable to stand or to walk. He trembles from exhaustion and his body becomes bathed in sweat. There is a profound sense of sinking in the epigastrium and very frequently gastric and abdominal pains make their appearance. Soon nausea, vomiting and profuse diarrhoea set in, the heart's action becomes weak, the pulse rapid, the extremities cold. In severe cases, or if the symptoms be not relieved by a temporary recourse to the drug, the patient may become greatly agitated or disturbed, moans or cries out or may become confused and delirious."

A. R. Cushny—1918.[27]

"In the beginning the quantity used is small, but as tolerance is attained, ever larger quantities are required to produce any effect, until as De Quincey states in his "Confessions of an Opium-eater," 320 grains of opium may be required to stay the craving. The effects are generally described as stimulant, but it seems possible that they consist rather in depression of the sensibility by which the unfortunate patient becomes unconscious of the miseries of his condition, and may accordingly be able to perform his duties and maintain appearance better than when deprived of the poison. The symptoms of the opium habit are exceedingly indefinite, and the diagnosis is often almost impossible. The statements of the patient ought not to be taken into consideration, because these unfortunates seem to have lost all idea of honor and truthfulness. As a general rule they are nervous, weak in character and wanting in energy, and utterly unfit for work unless when supplied with the drug. The pupils are often contracted, the heart sometimes irregular, and tremors and unsteadiness in walking may be apparent. The appetite is bad and a considerable loss in weight occurs, and the movements of the bowels are irregular, constipation alternating with diarrhoea. Eventually melancholia and dementia may follow the prolonged use of opium, and especially of morphine. Some continue the habit for many years, however, and it would seem with comparative immunity."

---

[26] Dercum, F. X.—Relative Frequency of Drug Addiction among Middle and Upper Classes; Treatment and final Results. Penn. Med. Jour. Feb. 1917.

[27] Cushny, A. R.—Pharmacology and Therapeutics or the Action of Drugs—1918.

W. A. White—1918.[28]

"The physical symptoms of prolonged use of opium in any of its forms are anorexia, irregular action of bowels, constipation alternating with diarrhoea, cardiac weakness, general muscular weakness and tremor, miosis and sluggish pupils, impotence, amenorrhoea, diminished sensibility, paresthesias, sensation of coldness."

* * * * *

"Mentally there is a gradual degradation. The memory and power of attention become impaired and the capacity for initiation is lost. There is marked impairment in the ethical feelings and previously honest persons will begin by lying out of business engagements and about the taking of the drug and end by associating with the most degraded persons and resorting to any means whatever, even criminal, to obtain the drug.

"Some persons who have taken opium in some form for a considerable time and in large doses develop an hallucinated state that may be of paranoid coloring or may be distinctly delirioid. Thus one patient (laudanum and whiskey) on admission to the hospital said that her food was poisoned. Another patient (morphine) is restless and excited, has hallucinations of hearing and carries on conversation with imaginary persons. Sometimes her language is violent and abusive, she threatens her imaginary persecutors and will jump out of bed and run through the hallway looking for the people she thinks are after her.

"Opium has much less tendency to produce tissue degeneration than alcohol and many persons continue for years to take small doses with little apparent harm."

* * * * *

"Symptoms of abstinenee, if they appear, are referable to the heart, stomach, bowels and nervous system; they are circulatory failure, respiratory disturbance, pyrosis, vomiting, diarrhoea, tremor, general debility, an hallucinatory delirium and sometimes profound collapse.

"If the mental and physical symptoms become grave morphine should be given and will usually relieve them. The evening dose should be omitted last, to combat any tendency to insomnia, and full feeding, massage and hydrotherapy are valuable adjuncts."

---

[28] White, W. A.—Outlines of Psychiatry—1918.

W. M. Kraus—1918.[29]

Kraus states that the withdrawal symptoms are to be encountered not only during withdrawal, but also during the intoxication itself. Every injection acts very naturally, but for a definite period, the length of which depends upon the dose. If this action commences to cease or stops entirely, due to the failure to make another injection, withdrawal symptoms will appear. Failure to appreciate this, he says, has retarded our understanding of morphin as a habit-forming drug. He states:

> "The explanation of this sudden reversal of symptoms lies in the fact that morphine taken as a habit-forming drug upsets the normal equilibrium between the sympathetic and the autonomic systems, establishing a new one. When this new equilibrium is destroyed by taking away the drug, symptoms naturally result.
>
> "A description of the withdrawal symptoms warrants a classification. The words *withdrawal symptoms* imply that the symptoms are due to the absence of morphin, that this absence is the *primary cause.* Since this is not the entire truth, the symptoms of withdrawal have been divided into two general classes:
>
> Class A.—Symptoms referable to the effects of morphine.
>
> Class B.—Symptoms referable to conditions existing before the onset of the habit.
>
> (1) Physical (2) Psychical
>
> "Class A.—These symptoms are the opposite to those produced by morphine. The muscular elements of the eye become very active. The pupil dilates. Its reactions are very labile. Accommodation paresis is common and troublesome. Diplopia occurs sometimes.
>
> "The lachrymal gland becomes very active. The conjunctival sac becomes moist and tears are often the result.
>
> "The nasal secretions are increased. Coryza is frequent. Sneezing, due in part to increased reactivity of the nervous system, in part to local irritation of secretions, is one of the first symptoms, one of no mean diagnostic value in an attempt to discover the presence of a habit by withdrawal.
>
> "Asthma is often complained of. That is, a bronchospasm. A 'cold' appears in some, a mild bronchitis, due to hypersecretion of the bronchial epithelial glands, not at all like the dry hacking cough occasionally found in the habitué.
>
> "The rate of respiration increases on withdrawal.
>
> "Symptoms referable to the heart are the most dangerous. They are best considered with those referable to changes in blood-pressure. The heart-rate is increased, the pulse may become very rapid, thready, a sign of impending collapse. The blood-pressure falls, due to cardiac collapse.

---

[29] Kraus, W. M.—An Analysis of the Action of Morphine upon the Vegetative Nervous System of Man. Jour. of Nervous and Mental Diseases. July 1918. Vol. 48. No. 1.

"Salivation is one of the first symptoms of withdrawal.

"The hypoacidity of the habit reverses itself. Hyperacidity takes its place. This formed the basis of Hitzig's method of withdrawal. By giving alkalies, Erlenmeyer modified the gastric lavage used by Hitzig. Erlenmeyer's experience with this method, lasting over twenty years, has been most gratifying. Diarrhoea is prevented, and the visceral symptoms in general are almost nil.

"Besides hyperacidity, nausea and vomiting are frequent, due to the labile and overactive nervous system.

"The chronic constipation of the habit changes to a profuse diarrhoea. Colicky pains may accompany this.

"Profuse sweating is one of the first signs of withdrawal and stands as a contrast to the dry skin of the habitué. In the first paper we used this fact as a proof that morphine depresses the sweat-apparatus. Those who have seen the dry skin of the habitué and the sweating of withdrawal will realize their relation. Vasodilation accounts for the mild perspiration produced occasionally by morphine in therapeutic or slightly larger doses.

"The cramps in the extremities are among the most distressing of withdrawal symptoms. They are due to a vasoconstriction and recall the cramps produced in some individuals by very cold water. Adrenalin was tried in a few cases, and, as was to be expected, increased the suffering. The beneficial effect, on the other hand, of hot baths is well known. Nitrates are also of great benefit.

"The menses are almost always absent during the entire period of chronic morphine poisoning, excepting a short time at the beginning of the habit. However, in spite of this amenorrhoea, pregnancy may occur, showing that the ovary, as far as the follicular apparatus goes, is still functioning. The explanation for this is not readily obtained, for the many aspects of the relations of the ovary to menstruation are as yet unsettled. After a cure, the menses return. The first few menstrual flows are usually excessive in amount and duration.

"With the exception of a primary euphoria, those addicted to morphine have little or no sexual interest (in the narrower sense of the word). After withdrawal this usually returns, and with great intensity.

"There is, as a rule, an absence of spermatogenesis during morphine addiction. This disappears on withdrawal.

"During chronic morphinism the power of erection is often lost. Upon withdrawal it usually returns. Nocturnal pollutions may occur.

"In chronic morphinism, there are a number of symptoms suggestive of chronic hypothyroidism: dry skin, trophic changes in the nails, teeth and hair. Besides this there are the entire group of vegetative nervous system symptoms, which may form a part of hypothyroid states. Gottlieb showed that thyroid-fed rats had a diminished tolerance to morphine, while thyroidectromized rats showed an increased tolerance. From this we could say that rats tolerated morphine in proportion to the degree of hypothyroïdism. If this is proved by further work, it will be of great value in determining the best dose of morphine in dysthyroidism. Furthermore, if morphine is tolerated better by thyroidectomized rats, it would seem but natural that as a tolerance to morphine is obtained, a concomitant hypothyroidism should result. The evidence of the physical findings in chronic morphinism points to a depressor effect upon thyroid activity. The thyroid is the familiar accelerator of metabolism and the vegetative nervous system. Thus there is depression of an accelerator function.

"Since there are vegetative nerves to the thyroid, it is probable that any effect produced results from changes in their activity. Morphine has no action upon gland tissue.

"The symptoms which have been described are all attributable to the lack of the effect of morphine upon the organism—more particularly upon the vegetative nervous system. *They are clearly the opposite to those produced by morphine, and thus serve as a further proof of the effects of its action.*"

W. Hale White—1924.[30]

"The symptoms are that the patient loses all sense of right and wrong, he will lie and thieve in the most degrading way, especially if his desire is to obtain the drug, and absolutely no statement that he makes can be trusted. He neglects his work, and lets his business go to ruin. He wastes and becomes anaemic, he suffers from loss of appetite, indigestion, dry mouth, sluggish bowels, and a foul tongue. The nails are brittle, the skin dry, the hair turns grey early, and falls out. There is sexual impotence, no erections take place, no semen is secreted; there is amenorrhoea, and the flow of milk is stopped, but there is polyuria. The pupils are small, and loss of muscular power, slight ataxy and tremor are present in severe cases. The arms or other parts are scarred with marks of the syringe, and 20 grains of morphine a day are sometimes taken."

O. H. Plant and I. H. Pierce—1928.[31]

In the first of a series of three articles on chronic morphin poisoning after a brief review of the meager accounts available in the literature of the symptomatology of chronic morphin poisoning and withdrawal in animals, the authors state that the recording of their observations appeared to them valuable, first, "because many observers have noted marked variations in symptoms in individual animals and if these variations are better known they may help to account for the widely differing theories as to the cause of morphin tolerance and of withdrawal symptoms;" and second, for the reason that "such observations would make possible a more complete comparison between chronic morphinism and withdrawal in dogs and the corresponding clinical conditions in human subjects." Their data relate to twenty-six addictions with twenty-two withdrawals on eighteen dogs, some of which were re-addicted once or twice. The period of addiction of their animals varied from forty-nine to three hundred thirty days and withdrawals were made at levels of dosage ranging from thirty to two hundred thirty mgm. per kgm. of morphin sulphate.

---

[30] White, W. Hale—Materia Medica, Pharmacy, Pharmacology and Therapeutics. 1924.

[31] Plant, O. H. and Pierce, I. H.—Studies in chronic morphine poisoning in dogs. I. General symptoms and behavior during addiction and withdrawal.

Through the courtesy of the authors and of the editor of the American Journal of Pharmacology, in which this article will appear, we have been enabled to publish the abstracts and quotations included in this volume.

After describing the selection of animals, the control period of observation, the diet, exercise and hygiene, they state that observations were made regularly at two hour intervals during the day between 7:30 a.m. and 5:00 p.m. and occasionally between 8:00 and 12:00 p.m., beginning four weeks before the administration of morphin and continuing through the period of addiction and withdrawal, the temperament and behavior of the animals, as well as their physical state being noted. Morphin sulphate was employed throughout, injected subcutaneously in ten per cent. solutions. For the most part the drug was given in single daily doses at about 9:00 a.m. In some cases multiple doses were used.

The observations recorded included changes in weight, vomiting, salivation, narcosis, constipation, general behavior, appetite, parturition during addiction, hypersensitiveness and skin rashes, and convulsions and muscular rigidity during addiction.

In all cases but one withdrawal of the drug was abrupt. As to the severity of symptoms the authors state:

> "In one dog small doses of morphine were administered on the second, third and fourth days of the withdrawal period.
>
> "Of the 22 withdrawals in which we have studied symptoms and behavior, 2 animals showed very marked symptoms (one died); 8 showed marked symptoms; 6 moderately severe symptoms, while in 6 the symptoms were slight. In the latter group while no marked disturbances were observed there were always sufficient symptoms to easily distinguish them from normal animals.
>
> "Symptoms as a rule began on the second day of withdrawal; they were most severe during the first week but in some instances continued for 8 to 12 days.
>
> "There was no distinct relationship between the size of the dose at withdrawal and the severity of the symptoms although the two animals that showed very marked symptoms were withdrawn at a low dosage level (30 and 40 mgm. per kgm.). On the other hand, half of the animals that showed marked symptoms were withdrawn at a dosage of more than 100 mgm. per kgm. The three animals that were withdrawn at high dosage (200 mgm. per kgm. or over) showed only slight symptoms."

The following observed symptoms were then recorded in detail: tremors, twitching and rigidity in voluntary muscles; groaning, howling and whining; restlessness; gnawing at objects within reach; change in temperament and behavior; hiccough; photophobia; salivation; vomiting; muscular weakness; respiratory distress and panting; temperature; sleepiness; diarrhea; and loss in weight.

In general the authors state:

"The symptoms of withdrawal after a second or third addiction did not differ in character from those observed after first addiction. The individual animals reacted in the same way each time they were withdrawn, but in three of them the symptoms were more severe during the second withdrawal; in these three animals the period of addiction was shorter and the dose much smaller than at first withdrawal. (CDA 10, 12 and 13). In one animal that was addicted and withdrawn three times (CDA 7) the symptoms during withdrawal were never marked, although it was twice withdrawn at high dosage level (210 and 230 mgm. per kgm.) and once at a low dose (50 mgm. per kgm.). In the first experiment with this animal the addiction was developed slowly and covered a long period (330 days), in the second it was developed rapidly (83 days), while in the third the period of addiction was short (58 days) but the dose at withdrawal was relatively small.

"Our observations seem to indicate, therefore, that the marked variations which we encountered in severity of withdrawal symptoms are due to differences in the individual dogs; that they are not dependent on size of the dose or length of addiction.

"The period of addiction in dogs has given a picture that follows fairly closely the descriptions of addiction in man if one excludes certain mental or psychic changes which obviously cannot be determined in dogs. Many of the symptoms which we observed have been noted in human addicts: marked differences in individuals, vomiting, constipation, hypersensitiveness, scratching (rashes), change in temperament (irritability), and decrease in narcotic action of the drug. We realize that even our longest experiment is much shorter than the usual case of human addiction; that the poisoning was more rapidly produced and the dosage much greater than would be possible in man. It is possible that the similarity between human and canine addiction would be greater if, in the latter, the drug was administered in smaller amounts and over greater periods of time (years instead of months).

"The similarity between withdrawal symptoms in our dogs and those described in man is much closer than during addiction. While it is true that very few of our animals gave a complete picture of the usual symptoms observed in human addicts after abrupt withdrawal, yet together they form a composite picture that includes practically all of the human symptoms that could be distinguished in an animal. One dog in particular showed symptoms that were very similar to those of abrupt withdrawal in human addicts. For this reason we give below a more detailed protocol of this animal:

"CDA 13. Female Boston bulldog. Second addiction. Withdrawal at 30 mgm. per kgm. after 70 days addiction.

"*First day.* Salivation as usual in the morning; somewhat brighter and more responsive. About 4 p.m. became very restless, moved about in the metabolism cage continuously. Very marked tremors in muscles of hind legs and head. Whined and groaned at times.

"*Second day.* 9.30 a. m. Howling, barking, and groaning. Extreme tremor and jerkiness all over her body, legs stiff, belly retracted and hard; very restless, moving stiffly from side to side of cage and often bumping it. Tremors and stiffness very near spasms but animal stays on her feet most of the time. Respiration short, jerky and noisy; mouth open but tongue not hanging out. Very thirsty, drinks water frequently. Rectal temperature 103° F. (Day before withdrawal it was 101.6° F.). Vomited twice.

"9.35 a. m. Morphine sulphate, 30 mgm. (about one-sixth of former dose). Within 20 minutes all symptoms had disappeared; no tremors, no rigidity, breathing slow and regular, no narcosis; active and friendly and shows interest in other dogs and appears normal in every way.

"4 p. m. Quiet and dozing, easily aroused but growls when disturbed (had never been cross before).

"*Third day.* 9 a. m. Very noisy, barking and howling; tremors very marked, legs twitching and jerking. Moves about continuously. Marked respiratory distress. When prone on floor her head is drawn back, legs stiff. Very thirsty. Friendly. Seems actually to beg for a dose. 11.00 a. m. Condition is worse. Howling continuously. Tremors are very marked. Condition very much like parathyroid tetany except that animal is more restless. Drew blood for calcium determination. When taken from cage and placed on table for injection she immediately became quiet. Received 20 mgm. morphine sulphate (one-tenth usual dose). Within a few minutes all symptoms disappeared. Was quiet, friendly, and to all appearances normal. 4.30 p. m. Is again somewhat restless and cross. No tremors or respiratory distress. Liquid stool.

"*Fourth day.* 11.30 a. m. Noisy, restless, raging and howling like a wild animal. Tremors and twiching as marked as yesterday; marked dyspnoea. Friendly and begging to be taken out of cage. Salivation is quite marked. Liquid stool. Vomited. When placed on table for obtaining blood sample she became quiet but was noisy and restless when returned to cage. An injection of 0.5 cc. distilled water produced quiet for about 2 minutes then symptoms returned and were as severe as ever.

11.50 a. m. 10 mgm. morphine sulphate (one-twentieth of usual dose) caused complete disappearance of all symptoms within 15 minutes and changed her from a wild raging animal into an apparently normal dog. Remained quiet for several hours.

> 5.00 p. m. Somewhat restless but not noisy; slight tremors can be felt. Friendly.
>
> "*Fifth day.* Very restless and noisy; tremors are still marked but none of symptoms as severe as yesterday. Diarrhea. Sleeps a little. Dyspnoea not marked. No morphine.
>
> "*Sixth to Twelfth day.* Tremors and rigidity gradually diminished; slept for longer periods and howling was less persistent.
>
> "*Thirteenth to Twentieth day.* Improved rapidly. Showed marked weakness and sleeps most of the time.

"The symptoms in this animal were more severe than in any other withdrawal, except in the dog that died on the third day, and were more marked than in her first withdrawal at a higher dose (160 mgm. per kgm.) and longer addiction (161 days). Figures for blood calcium in this dog fell within the normal variations.

"Another animal (CDA 11) was re-addicted to the same dose and for the same period as the one described above, and was withdrawn at the same time; it showed only moderately severe symptoms.

"SUMMARY

"Symptoms and behavior are recorded in twenty-four addictions to morphine and in twenty-two withdrawals in dogs, in which detailed observations were made over periods covering from 49 to 330 days and with doses of 30 to 230 mgm. per. kgm.

"Considerable variability in symtoms during chronic poisoning with morphine was observed.

"The severity of withdrawal symptoms varied markedly in different dogs. These differences are not related to length of addiction or size of dose at withdrawal. Two dogs showed very severe symptoms during withdrawal and in both of these the dose was relatively small. Two animals died in addiction during administration of large doses. One died on the third day of withdrawal.

"When the symtoms observed in this group of dogs are considered as a whole they form a composite picture that is strikingly similar to that obtained in chronic morphine poisoning in man; this is particularly true of withdrawal symptoms.

"We believe that the observations reported in this paper show there is marked similarity between morphine addiction and withdrawal in man and in dogs; that this similarity makes the dog a particularly suitable test object for the study of many phases of the morphine problem; that results obtained in experiments on dogs can be applied to the problems of morphine addiction with greater validity than those on any other laboratory animal."

One of the dogs died on the fourth day of withdrawal. The withdrawal symptoms in this animal had been especially severe. On the afternoon of the third day there were short periods of unconsciousness when animal failed to respond although restless and howling. Marked respiratory distress. Tremors and twitching looked like parathyroid tetany. No actual convulsions were observed. The animal died during the night and the post mortem examination indicated that convulsions occurred before death.

In two tables are shown the details of variations in weight during addiction and withdrawal, and a summary of the symptoms of all the animals used together with the breed, length of addiction and dose at withdrawal.

CHAPTER VIII

TYPES OF USERS

Along with a consideration of the extent of the problem, its development, and nature, it is important to determine the kinds of individuals affected in order to discover, if possible, for purposes of control any common factors present. Such an attempt at classification for the determination of the types of persons involved may be approached from many angles according to the particular information desired. For example, any or all of such factors as race, age, sex, physical condition, mental and ethical traits, social status, occupation, environment, education, etc., may be covered. Comprehensive classification along any of these lines has a value and may lead to distinctly important findings.

Any of the above classifications may be applied, furthermore, to chronic opium users as of two periods, namely, the period preceding their use of the drug and the period following this use. By an application of such distinctions we should be able to determine both the kinds of individuals who become users and the effects of chronic use upon these individuals. Such a classification would have distinct etiologic and prognostic value and should assist very materially in determining and applying the details of control activities.

It will be seen at once, however, that any such detailed classification into types involves an abundance of material dealing with several aspects of this problem which in previous chapters we have indicated is lacking or is of such a fragmentary nature as to preclude its use for purposes of generalization. In what follows, therefore, we are presenting such data as we have been able to collect bearing on one or another of the factors or conditions affecting those suffering from chronic opium intoxication. In its perusal the reader must bear in mind constantly the incompleteness of knowledge on the subject and the intrinsic value of the evidence submitted as affected by the wide or limited experience of the individual writer, his professional tendencies and the groups dealt with, all of which influencing factors are self-evident in the quotations and references given.

Sex Distribution

Here we find, as in the consideration of other phases of the problem, that the available material is too fragmentary and too strongly influenced by special factors to serve as a wholly satisfactory basis for generalizations. As we have pointed out elsewhere, it is only through studies of long and representative series of cases that we shall be able to reach definite and unassailable conclusions as to the extent of chronic opium intoxication and its distribution by sex, age, and other groupings. In the absence of such desirable data, the following is presented as comprising the best information available to date.

In the section dealing with etiology we have seen what Smith,[1] 1832, states in his inaugural dissertation on opium as to the predilection of women for these drugs.

A. Calkins—1871.[2]

". . . in the division of sex the women have the majority . . .

". . . The Cyprians who perambulate Broadway by gas-light are reliant upon laudanum in extremity not only, but partial to the same for its stimulating power. Loines reckons that two-thirds of the class become habituated eventually to opium in some form; it may be laudanum, or as likely morphine, going to the amount of 5 grains of the latter for the daily dose. In New York their purchases are made on the Avenues chiefly, and besides they partake habitually and largely of strong liquors. A young man, an apothecary on Union Square, gives similar testimony regarding the courtesans of Savannah. Those accounts square very precisely with the observations of Dr. Quackenbos who remarks further, that the aggregate of instances among women in high place is incredibly large."

O. Marshall—1878.[3]

Marshall, as we have seen in the chapter on extent, in his survey in the State of Michigan, gives the following sex distribution of 1313 cases,— 510 or 38.8% males and 803 or 62.2% females. These cases, it will be remembered, were collected by Marshall through correspondence addressed to physicians throughout the state and represent the number so reported from 96 towns and villages. In these cases, there would appear to be no factor which might influence unduly the number of either sex reported. They would seem rather to be a fair cross-section of the opium using population of the communities dealt with.

---

[1] Smith, W. G.—On opium embracing its history, chemical analysis and use and abuse as a medicine. New York. 1832.

[2] Calkins, A.—Opium and the opium appetite. Philadelphia. 1871.

[3] Marshall, O.—The opium habit in Michigan. Rep. of Board of Health. Michigan. 1878.

H. H. Kane—1880.[4]

Kane quotes Bartholow as follows:

> "'A delicate female, having light blue eyes and flaxen hair, possesses, according to my observations the maximum susceptibility.'"

Kane himself states that women outnumber men.

C. W. Earle—1880.[5]

Earle, in his study of cases in Chicago obtained through interviews with druggists in different sections of the city, states:

> "Among the 235 habitual opium-eaters, 169 were found to be females, a proportion of about 3 to 1. Of the 169 females, about one-third belong to that class known as prostitutes. Deducting these, we still have among those taking the different kinds of opiates, 2 females to 1 male. In one family I found the mother at the age of 65 taking one drachm of gum opium each day, and her daughter, at the age of 30, consuming two drachms of the tincture. One lady, aged 50, has taken it since she was 13 years of age. Suffering from some painful sickness during her youth, she was given, by a physician, a box of powders, on which was written 'Morphia'. She had the prescription repeated, and gradually found herself in the power of the seductive drug, from which in all probability, she will never be freed."

In this series it is possible that the relatively large number of prostitutes has increased the proportion of women, but even allowing for these, as the author points out, there would still be a preponderance of females. His figures show 28.1% males as compared with 71.9% females.

J. M. Hull—1885.[6]

> ". . . and as to sex, we may count out the prostitutes so much given to this vice, and still find females far ahead so far as numbers are concerned."

His series of 235 cases, collected throughout the State of Iowa, shows the following sex distribution,—86 or 36.2% males and 149 or 63.8% females.

---

[4] Kane, H. H.—The hypodermic injection of morphia. New York. 1880.

[5] Earle, C. W.—The opium habit. Chicago Med. Rev. 1880.

[6] Hull, J. M.—The opium habit. Report State Board of Health. Iowa. 1885.

T. C. Allbutt—1905.[7]

"In respect of sex there does not seem to be much difference; the anticipation that the practice would be found more prevalent in woman is not supported by facts. From my own experience I certainly should have said that the greater prevalence lay on the feminine side; however, Dr. Mattison, Dr. Levinstein, Dr. Erlenmeyer and other authors of weight, find the figures to run pretty equally between the sexes."

C. E. Terry—1913.[8]

Terry gives as the sex distribution determined from the cases handled at the health office and through duplicate records from physicians in Jacksonville, the following:—out of a total of 541, 228 or 42.1% were males and 313 or 58.9% females.

P. M. Lichtenstein—1914.[9]

Lichtenstein concludes from observations on 1000 handled in the City Prison, Manhattan, that males greatly outnumber females.

L. P. Brown—1914.[10]

Brown in a study of 2370 in the State of Tennessee, found the following sex distribution:—784 or 33.1% males and 1586 or 66.9% females.

C. B. Farr—1915.[11]

Farr, in a study of 120 cases of heroin use at the Philadelphia General Hospital, found that 91 or 75.8% were males and 29 or 24.2% were females. He also studied 176 cases of chronic opium intoxication in which other forms of the drug than heroin were used. Of these 94 or 54.41% were males and 82 or 46.59% were females. It is worthy of note that of the heroin users 41 used cocain also and of the cases using other forms of opium 40 used cocain. The types here represented were quite evidently drawn largely from the underworld where, as would be expected, the origin of the condition was mainly evil association,—hence, both the preponderance of males and the large number using cocain and heroin.

---

[7] Allbutt, T. C.—A system of Medicine. 1905.

[8] Terry, C. E.—Annual Report Board of Health. Jacksonville, Fla. 1913.

[9] Lichtenstein, P. M.—Narcotic Addiction. New York Medical Jour. 1914.

[10] Brown, L. P.—Enforcement of the Tennessee Anti-Narcotic Law. Amer. Jour. of Public Health. 1914.

[11] Farr, C. B.—The relative frequency of the morphine and heroin habits. New York Med. Jour. May 1, 1915.

J. McIver and G. E. Price—1916.[12]

McIver and Price, in a series of 147 cases also at the Philadelphia General Hospital, found that 103 or 70.1% were males and 44 or 29.9% were females. They state in this connection:

> "The majority of women were prostitutes, and some few of the men were or had been cadets. A number were notorious crooks and thieves. . . . The majority were dwellers in, or frequenters of, the 'tenderloin.'"

M. Craig—1917.[13]

Craig states that both sexes seem to be almost equally affected.

Special Committee of Investigation Appointed by the Secretary of the Treasury—1918.[14]

> "Contrary to general opinion the committee finds that drug addiction is not more prevalent among females than males. Reports obtained from some parts of the country show that the females outnumbered the males, while in other sections, officials reported a preponderance of males. Taking all factors into consideration, it appears that drug addiction is about equally prevalent in both sexes."

It should be remembered that the above committee did not differentiate between opium and cocain users but based their conclusions on statistics covering both classes. The majority of cocain users seem to be males.[15] Another fact to be borne in mind is that the statistics used were drawn primarily from institutional reports comprised in questionnaires answered by heads of penal institutions, almhouses, health officers, private hospitals and sanatoria.

J. A. Hamilton—1919.[16]

Hamilton reports a total of 388 persons received at the Workhouse, Blackwell's Island, New York City, during 1918 for drug treatment, of whom 351 or 90.5 were males and 37 or 9.5 were females.

---

[12] McIver, J. and G. E. Price—Drug Addiction. Jour. Amer. Med. Assn. Feb. 12, 1916.

[13] Craig, M.—Psychological Medicine. 1917.

[14] Traffic in Narcotic Drugs—Report of Special Committee of Investigation appointed March 25, 1918, by the Secretary of the Treasury, June, 1919.

[15] The material dealing with the sex distribution of cocain users is not abundant but such as we have seen substantiates this statement.

[16] Hamilton, J. A.—Drug Addiction and Crime. New York Med. Jour. 1919.

S. D. Hubbard—1920.[17]

Hubbard states that out of 7464 registered at the New York City Narcotic Clinic in 1919, 5882 or 78.8% were males and 1582 or 21.2% were females.[18] The only two drugs dispensed at the New York clinic were morphin and heroin. Dr. Hubbard does not state whether any chronic users of opium in the crude form or of other opium preparations applied for treatment and if so whether they were given morphin or heroin as a substitute for their drug of choice. The unusually large percentage of heroin users, 96.5%, indicates an excess of young males of the underworld or gangster type with whom heroin is the drug of choice because of its slightly different physiologic action and also because it is the drug of choice of the peddler, inasmuch as it permits easily of adulteration.

In the report of the narcotic clinic, Los Angeles, Dr. Bucher gives the following sex-distribution, 389 or 66.8% males and 193 or 33.2% females.[19]

Another series of cases which permit of statistical study has been obtained from Dr. Webster who conducted the narcotic clinic at Cleveland in 1920 and 1921.[20] During the period of its existence approximately 2000 cases were registered, but only 681 of these are available for study through having been entered in a separate record. Dr. Webster states, however, that these 681 are, as far as he can tell, typical of the whole. Of these 446 or 65.5% are males and 235 or 34.5% are females.

E. Meyer—1924.[21]

From a study of 90 cases treated from 1904 to 1923, this author reports as follows as to sex distribution and the age of beginning the chronic use of narcotics:

---

[17] Hubbard, S. D.—The New York City Narcotic Clinic and differing points of view on narcotic addiction. Monthly Bulletin of the Department of Health, City of New York, February, 1920.

[18] In considering and forming conclusions from the present material the reader will be assisted materially if he bears in mind the discussions relating to the operation of this clinic which will be found in other chapters. Of necessity such factors would bear as direct an influence upon the subject under discussion as they bore in the other relationships.

[19] See preceding footnote.

[20] From unpublished material loaned by G. E. Webster, M.D., Cleveland, Ohio.

[21] Meyer, E.—Ueber Morphinismus, Kokainismus und den Missbrauch anderer Narkotika. Med. Klinik. 1924. Vol. 20. pp. 403-407.

	Under 20 years of age	20–30	30–40	40–50	Over 50
Men	7	29	17	7	4
Women	–	8	8	1	1

A review of the foregoing material brings out decided differences of opinion as to the incidence of the sexes among the opium-using population. The majority of writers state that women outnumber men as victims. However, in order to understand the reasons for this distribution, it is necessary to examine the types with which the individual writers appear to have dealt. As a very general rule, it will be found that those giving a preponderance of women have been private practitioners of medicine, or those whose surveys presumably covered all classes, while those giving a preponderance of men have had experience wholly or chiefly with the inmates of correctional and other public institutions. Neither group has adduced evidence from sufficiently long series of cases to answer the question conclusively. It is natural, however, to suppose that among cases originating through the medical use of the drug women would exceed men in view of the greater frequency of recurrent or chronic, painful maladies among women. Many of these result from pelvic troubles and are, of course, peculiar to the sex. Whether or not other sex attributes having to do with the make-up of the individual have any etiological relationship we are not in a position to state. A cause frequently mentioned is painful menstruation which, from the nature of its periodic recurrence, is well adapted to induce sooner or later the chronic use of an opiate drug if such is taken for relief. The chronicity of the many pelvic inflammatory conditions needs no comment.

Among the cases dealt with by the medical heads of correctional and other institutions, however, other determining factors undoubtedly enter. Here the social groups dealt with are composed for the most part of criminal, underworld, or lower social types. Among these types of users there is little doubt that males preponderate. The greater exposure of young males to vicious associations, indulgences, and dissipations, the tendency to gang-formation, and the very great preponderance of males among peddlers all operate to bring to custodial institutions men rather than women.

The ultimate determination of sex preponderance must be based on material dealing accurately with the extent of the condition in the population as a whole. If it is found through future investigations that cases owing their origin to the medical use of the drug preponderate, it will doubtless be found that women preponderate. If, on the other hand, the illicit traffic, evil association, and other causes more peculiar to males than to females have brought about a greater number of cases of this type, a reverse sex distribution will doubtless be shown.

Age Distribution

In different series of cases the average age of chronic opium users varies considerably. No age period, however, is exempt. Even from birth, as indicated by the congenital cases, through infancy, with its soothing syrups and paregoric, to old age we find a varying number of victims.

In the consideration of the age period of the greatest prevalence of chronic opium intoxication, just as in the case of sex distribution, writers have reached different conclusions based on experiences with selected groups. In trying to determine the period of life in which the chronic use of opium is most frequently met, we must consider carefully the vitiating circumstances which creep in through such cause.

In what follows, we could wish for a greater abundance of material but, as in every other phase of this subject, the information is fragmentary.

C. W. Earle—1880.[22]

Earle states that chronic opium intoxication is "a vice of middle life, the larger number, by far, being from 30 to 40 years of age." In a series of 235 cases he gives the average age of males as 41.1 and that of females 39.4, the average for both sexes being 39.7. It will be remembered that approximately one-third of the women listed by Earle were prostitutes, which would tend to lower the average age of the females.

J. M. Hull—1885.[23]

Hull states that the age at which chronic opium intoxication is most common is the period between 50 and 60. In his series of 235 cases he does not separate the males and females so that only the combined average age of the sexes can be obtained. This figure is 46.5. Hull dealt for the most part with cases reported in small towns in an agricultural state, where in all probability the influences of prostitution and evil association in general were slight. This doubtless accounts for the greater average age of his cases than that of Earle's series.

---

[22] Earle, C. W.—The opium habit. Chicago Med. Rev. 1880.

[23] Hull, J. M.—The opium habit. Report Board of Health, Iowa, 1885.

C. E. Terry—1912.[24]

Terry found the average age of 551 cases, including 155 cocain users, both sexes, to be 35.2. (In another series collected a little earlier than the foregoing, 213 cases, the average age of beginning was found to be 26.1 years for males and 27.4 years for females or 26.7 for both sexes.)

L. P. Brown—1915.[25]

Brown found the average age of males to be 51, of females 49 and for the sexes combined 50. He comments as follows on his table of age periods:

> "Table IV is possibly the most instructive of this series, showing as it does, the per cent of each sex at different age-periods. Note in this the great preponderance of women from age 25 to age 44. In these two age-periods they form nearly three-fourths of the whole number of addicts, and this preponderance appears to so far prevail into the next period that 63.5 per cent of all females are from 25 to 55 years of age, as against only 59.6 per cent of all males. It will be at once apparent that the first twenty years of this period is about the age when the stresses of life begin to make themselves felt with women, and includes the beginning of the menopause period. It appears reasonable, therefore, to ascribe to this part of female life, no small portion of the addiction among women. Again it seems fairly safe to ascribe the slightly larger proportion of men in the first ten-year life-period to the fact that this is about the age when dissipations are commonly taken up, these being more distinctively a male attribute."

Brown gives the average age of beginning for males to be 37 years and 10 months and for females 37 years and 6 months.

C. B. Farr—1915.[26]

Farr states that a large proportion of the 120 cases of heroinism studied by him were young—in the twenties,—a few of whom began as early as the fifteenth year. The average age of his 176 opium users was much greater than that of his series of heroin cases. In the former there was a fair proportion of middle aged and elderly persons.

---

[24] Terry, C. E.—Annual Report, Board of Health, Jacksonville, Fla., 1912.

[25] Brown, L. P.—Enforcement of the Tennessee Anti-Narcotic Law. Amer. Jour. Public Health. 1915. Vol. 5. No. 4. pp. 323-333.

[26] Farr, C. B.—The relative frequency of the morphine and heroin habits. New York Med. Jour. May 1, 1915.

W. A. Bloedorn—1917.[27]

Bloedorn published a table giving the age periods of a series of cases studied at Bellevue Hospital, New York, covering admissions from 1905-1916 inclusive, in which sex distribution is not indicated. The following are the average ages determined from that table,—34.1 for opium users, 31.8 for morphin users, and 24.1 for heroin users. The average age for all cases is 28.3. This series illustrates very well the point already brought out as to the different age periods obtaining among users of different opium preparations.

S. D. Hubbard—1920.[28]

Hubbard gives the following age periods for the 7464 cases registered at the New York City narcotic clinic:

"Age	15-19	20-24	25-29	30-34	35-39	40-50	Over 50	Total
Number	743	2142	2218	1155	766	365	75	7464
Percentage	9	28	29	14	10	9	1	100"

The average age for these cases in which males and females are not separated is 23.7. It will be remembered that 96.5% of Dr. Hubbard's cases were heroin users and that the great preponderance, 78.81%, were males. Both of these factors conduce to an early average age, inasmuch as they mean an undue preponderance of young males owing their condition for the most part to evil associations.

The 582 individuals registered at the Los Angeles narcotic clinic, 1920, were distributed as to age as follows:

18 to 20 years	5	50 to 60 years	28
20 to 30 years	211	60 to 70 years	13
30 to 40 years	221	70 to 80 years	4
40 to 50 years	98	80 to 90 years	2

The average age figured from the above table is 35 years.

Webster's series [29] from the Cleveland narcotic clinic, 1920-21, gives an average age for males of 33.9 and for females 33.5, the average age for both sexes being 34.6. In this series of 681 cases the drug used was morphin except in one instance. This higher average age as compared with that of the New York City clinic would appear to indicate a different type of user from that predominating in the latter series.

---

[27] Bloedorn, W. A.—Studies of drug addicts. U. S. Naval Bull. 1917.

[28] Hubbard, S. D.—The New York City Narcotic Clinic and differing points of View on Narcotic Addiction. Monthly Bulletin, Department of Health, New York City. February, 1920.

[29] From unpublished material loaned by G. E. Webster, M.D., Cleveland, Ohio.

Alexander Lambert—1922.[30]

Referring to his study of 1593 cases, "persons in comfortable circumstances of life and occurring in private practice," Lambert states the following:

> "In the cases collected by Lambert, 17 per cent of the patients were under thirty, 31 per cent were between forty and fifty, and 18 per cent were over fifty years of age. In the age grouping, it is a noticeable feature that of those taking heroin 66 per cent were under thirty, while of morphin addicts only 12 per cent were under thirty."

C. F. Collins—1922.[31]

Commenting on the age of cases coming under his notice in the Court of Special Sessions, New York, Judge Collins gives the following:

Comparative Percentage Table as to
Males 83.2 per cent and Females 16.8 per cent

Year	Average age		21 years and under	Under 21 years
		%	%	%
1916........	23 years	48.12	28.27	18.91
	24 years	54.29		
1917........	26 years	54.6	20.1	12.3
	27 years	57		
1918........	25 years	49.7	16.2	10.5
	26 years	54.15		
1919........	26 years	51.7	12.6	6.5
	27 years	56.1		
1920........	25 years	46.5	17.8	8.2
	26 years	53.5		
1921........	26 years	44.8	12.32	6.16

---

[30] Lambert, A.—Nelson's Loose-leaf Medicine. 1922.

[31] Collins, Cornelius F.—Proceedings 13th Annual Conference N. Y. State Assn. of Magistrates. Feb. 6-7, 1922. Report of Committee on Drug Evil. pp. 117-129.

New York State Commission of Prisons—1924.[32]

In a report on the findings of a special committee appointed by this Commission to investigate the problem of addiction, the following table is given to show the ages of 237 addicts convicted of felonies and sentenced to certain state prisons between January 1, 1921 and September 1924:

D. Oberteuffer—1924.[33]

Oberteuffer under the supervision of Professor Thomas D. Wood of Teachers College, Columbia University, New York, through a questionnaire survey made a study dealing in part with the use of habit-forming drugs by the high school children of New York State.

Questionnaires were sent to 687 schools in the state including all that are given the rating of Senior High School or High Schools. From these 360—52.4 per cent— replies were received, representing 152,824 pupils. Among this number there were no cases of drug addiction known.

In addition to the above data we are giving below material which we have collected as to the use of drugs by school children. Reports have been made from time to time of the use of these drugs by grammar and high school pupils and much publicity has been given by the daily press to such alleged conditions. Wherever such reports have come to our knowledge we have followed them to their source in an effort to obtain the actual facts. In practically every instance we have found that the published statements were greatly exaggerated and in some instances were based apparently upon rumor alone without even a single actual case in substantiation.

The following examples are typical of the published reports and our findings upon investigation:

A year or so ago we investigated a press item that was widely circulated to the effect that the children of a certain school were said by one of the teachers prominent in a woman's club to be addicted. Correspondence with the teacher in question brought out the fact

---

[32] New York State Commission of Prisons. Special Report on Drug Addiction. December 2, 1924.

[33] Oberteuffer, D.—Preliminary report of a survey on the subject of habit-forming drugs in the New York State High Schools. December 31, 1923 to February 9, 1924. (This unpublished report was made available through the courtesy of Prof. Thomas D. Wood.)

TABLE

Showing the Age of Drug Addicts, When Committed

Age	Auburn %	Clinton %	Sing Sing %	Total % by age groups	
18.....	0	0	2	2	Under 21 yrs.
19.....	0	1	1	2	
20.....	0	1	4	5	
	0— 0.0	2— 6.2	7— 3.8	9— 3.8	
21.....	1	1	6	8	21 to 30 inclusive
22.....	0	2	8	10	
23.....	0	0	11	11	
24.....	0	2	14	16	
25.....	4	1	9	14	
26.....	1	2	12	15	
27.....	0	2	15	17	
28.....	2	1	17	20	
29.....	1	1	9	11	
30.....	2	4	6	12	
	11—50.0	16—50.0	107—58.5	134—56.6	
31.....	0	2	7	9	31 to 40 inclusive
32.....	1	0	8	9	
33.....	1	0	9	10	
34.....	0	3	4	7	
35.....	1	1	7	9	
36.....	0	1	6	7	
37.....	0	1	2	3	
38.....	1	2	1	4	
39.....	0	0	6	6	
40.....	3	0	1	4	
	7—31.8	10—31.3	51—27.9	68—28.7	
41.....	1	1	1	3	Over 40 yrs.
42.....	1	0	5	6	
43.....	0	0	2	2	
44.....	0	1	1	2	
45.....	0	0	1	1	
46.....	0	0	2	2	
47.....	1	1	2	4	
48.....	0	0	1	1	
49.....	0	0	0	0	
50.....	1	0	1	2	
51.....	0	0	1	1	
52.....	0	1	1	2	
	4—18.2	4—12.5	18— 9.8	26—10.9	
Grand total.	22	32	183	237—100	

that she had no accurate information and that her public statement amounted to nothing but a rumor brought to her by a child, that as far as she knew was without basis in fact.

From another city have been reported some cases of the use of opium by delinquent girls who obtained it in a dance hall. This was corroborated by correspondence but the conditions were quickly broken up by the local authorities.

A later press report related to the selling of narcotics to school children in one of the large eastern cities. We wrote to the chief of police who was reported to have charge of the investigation. He replied that after an extended investigation nothing could be found which in any way connected the high school pupils with the sale of narcotic drugs.

Even among the juvenile court cases chronic opium intoxication is uncommon. This we investigated through letters addressed to 378 judges of juvenile courts from whom we received 122—32.2%—replies. From this number, who in the aggregate were handling thousands of juveniles a year, only 6 cases of chronic opium intoxication among delinquents were reported of which 3 came from one locality and the other 3 individually from different cities. Inquiries made from chiefs of police brought forth 2 cases from 45 cities.

From the above we may conclude that while chronic opium intoxication among juveniles is a potential danger, up to the present it has not existed to any great extent and that the reports which so far have been published in the daily press practically always have been greatly exaggerated. In our opinion it is extremely unlikely that addiction to narcotic drugs ever will become prevalent among school children. The price of these drugs as sold in the illicit traffic—from one to five dollars a grain—alone is a deterrent to their use by children of school age whose usual small means would not enable them to become lucrative customers.

The variations in the average age of users reported in the preceding data probably bear a definite relationship to the etiology of the corresponding series of cases involved. This relationship indeed is so constant within certain limits as to enable us to judge of the leading etiologic factors in any given series by noting the average age of the users. One will find, for instance, that the medical cases present an average age considerably higher than that of the users who acquired the condition through dissipation or vicious association. Naturally, we should expect the average age in the cases of medical origin to be found in that period of life contributing the greater part of painful, recurrent, or chronic conditions. Such seems to be the case where the influence of child-bearing, pelvic inflammatory troubles, rheumatism, neuralgias, or other conditions of this type, which occur principally in the third and fourth decades of life, is a prominent causative factor. In the underworld cases, on the other hand, where example, alcoholic excesses, evil associations, and the very common desire, especially among young men, to "try anything once" or to emulate the actions of others are of etiologic import, the average age of users of opium preparations is considerably younger. This period corresponds to that period of life in which ignorance, curiosity, and the spirit of adventure combine as potent influences of conduct.

The youth of chronic opium users is frequently a matter for public comment by those advocating certain reform measures. The apparent basis of such claims is the age of cases seen in correctional institutions, in some of the clinics, and in the free wards of general hospitals. Such series, as the foregoing material indicates, comprise chiefly heroin users and, because of the circumstances surrounding their collection, are not typical of the opium-using population as a whole and should not alone be considered in connection with prevention and control.

As a general rule, we find that the average age of chronic opium users apparently has been decreasing, as a study of the earlier series of cases shows this average age to be considerably higher than that of the more recent series. This is significant of the introduction of new and different etiologic factors, of which we find evidence in the growing use of these drugs among young people of both sexes, resulting chiefly from the illicit traffic. Those which give the lowest average age are the series reported since the passage and enforcement of the Harrison Narcotic Act, dealing for the most part with situations existing in large centres of population and comprised of anti-social groups in custodial institutions.

Form of Drug Used

There is a further aspect of chronic opium intoxication which is of especial interest in connection with sex and age distribution as well as with the etiology of the condition. It has been the common observation of practically every student and one which has given rise to frequent comment that different types of individuals, different etiologic factors, and even sex and age periods have been influential in the selection of the particular opium preparation used. It is inevitable that in the earlier days of opium usage for medicinal purposes the cruder forms of opium should occupy practically the whole field, as the alkaloids had not yet been discovered. With the discovery and manufacture of the various opium products, as we have pointed out in the chapter dealing with the development of the problem, the popularity of their employment developed in the following order,—crude opium, mithridatium, theriaca, philonium, and diascordium, later the tinctures, powdered opium, and Dover's powder, and finally the alkaloids and their derivatives. It is natural also that, in accordance with their special properties or the properties thought to be possessed by them, certain preparations should have acquired popularity over others and that certain physicians and schools should have selected and clung tenaciously to favorite forms of this valuable drug. With the advent of the hypodermic the use of the alkaloids was increased markedly and for a while they usurped almost completely the places held by the earlier preparations. Later with the discovery of heroin and its alleged unique properties, especially valuable in certain conditions, a still further refinement of practice was made possible. While recently its employment in medicine has become unpopular owing to its widespread use in the underworld, there is even today a lively discussion as to its merits and demerits and medical opinion is quite sharply divided as to its place in therapeusis.

Almost every opium preparation has some action distinct from that of the others and not only the medical profession but the laity as well have become more or less informed as to these distinctions and differences. With the cases of chronic opium intoxication owing their origin to the therapeutic use of the drug whether prescribed by physicians or suggested by patent medicine advertisements, drug clerks, or the promptings of the general and common tendency toward self-medication, it is natural that certain preparations should have been used for certain purposes. Thus, because of their peculiar value, we should expect the employment of the cruder forms of opium in intestinal conditions, of morphin for the relief of pain, of codein and later heroin for respiratory troubles and so on. We find in the histories of the cases studied evidence of such therapeutic selection. The age of the patient and the length of the intoxication have also a direct bearing on the selection of the opium preparation. Thus the chronic opium users among veterans of the Civil War and others of their generation are much more likely to be found using gum opium, powdered opium, or laudanum than are those among the veterans of the Spanish War or of the late World War, where morphin was the drug of common choice. The selection of particular opium preparations, dependent on the stage of development in opium usage of the period and on therapeutic choice, is easily understood and needs little or no comment. With the advent of heroin, however, and the passage and enforcement of strict prohibitory legislation, new and unusual factors entered.

Reference already has been made to the fact that some time prior to the awakening of the medical profession in America the underworld was using heroin. It seemed to fill a place not easily duplicated by other opium preparations in the desires of the vicious user. The stimulating effect of heroin is known to be greater than that of morphin and this quality added to its narcotic property is a sufficient reason for its preference as a drug of dissipation. The facts also that it is easily absorbable through a mucous membrane as that of the nose, that it requires no equipment such as a hypodermic, and the consequent suggestion ever present in the minds of cocain users, have all combined to make it the opiate of choice of the underworld. We do not wish to be understood as meaning that there are no therapeutic cases of chronic heroin intoxication. On the contrary, there are a great many, but where evil association in conjunction with mental or moral degeneracy or abnormality exists, we usually find heroin to be the opium preparation of choice.

Here the influence of sex is seen; just as there appear to be more male alcoholics and more male cocain users there are also more male heroin users and for the same reasons. The exposure of males to evil suggestion is greater than that of females. There is more congregation of males in places of ill-repute. Occupation and the habits of the sex bring males more into contact with modes of dissipation in general and with the purveyor of illicit drugs in particular. Consequently we should expect to find a preponderance of heroin users in the early years of life in both sexes, particularly among young males.

Another factor is responsible for the recent increasing widespread use of heroin, namely the illicit traffic. There have been times in this commerce when smuggled heroin has been more easily obtainable than morphin and above all the ease with which heroin permits of adulteration without fear of discovery, thus permitting a very greatly increased profit to the trafficker, has made for its popularity in the underworld traffic. Heroin diluted one-half means profits increased 100% and the peddler has never been slow to embrace such opportunity for increased earnings. This preference of the peddler for heroin and the greater supply of the drug in the underworld market have had another result. Not only has it assisted in making heroin the drug of choice among underworld users but, also in conjunction with the deterring effect of anti-narcotic laws on the handling of cases of chronic opium intoxication by reputable physicians, a further increase in its use has occurred. Many individuals who had been using opium in some other form particularly morphin have been driven to peddlers for their supplies and, finding principally heroin available, have perforce adopted its use. There have been times in New York when morphin sold on the street as high as $80.00 an ounce while heroin was selling at a much lower figure. The cross-tolerance existing among the different opium alkaloids, permitting of changing from one to another, has made it not too difficult for the individual to forego his drug of choice and take up another which, for the time being, was more easily procurable. Thus a not inconsiderable number of cases owing their condition to the medicinal use of crude opium, laudanum, or morphin are today using heroin. In the chapter dealing with treatment we shall see in the statements of certain authors that this enforced selection has not been a beneficial one.

The chronic use of heroin was further increased as the result of its employment in the treatment of morphinism. We have seen in another chapter that it was early advocated in these cases and that as a result of such practice former morphin users had been transferred as it were to the newer preparation.

The distribution of cases as to drugs used, which have been reported from time to time, unfortunately has not been made so frequently as we might wish, but those data which we have at our disposal bear out the foregoing statements when considered in connection with the history of the problem, etiology, age and sex distributions.

We have prepared the following table of distribution according to drug used from the material available.

In view of what already has been said as to the series of cases included in the above table little more is needed. But we desire again to point out that in certain series, notably those of Farr, McIver and

TABLE XII

Distribution According to Drug Used of Cases Reported by Certain Investigators

Name of investigator and date	Source of figures	Opium	Laudanum	Paregoric	Morphin	Heroin	Unknown	Total number of cases reported
Marhsall, 1878	State-wide study	630 47.98%			683 52.02%			1,313
Earle, 1880	Chicago Drug Stores	50 21.28%	35 14.89%		120 51.06%		30 12.77%	235
Hull, 1885	State-wide study	73 31.06%	12 5.11%	6 2.55%	129 54.89%		15 6.38%	235
Terry, 1913	City survey	14 2.59%	108 19.96%		292 53.97%	28 5.18%	99 18.30%	541
Brown, 1915	State survey	5.06%	7.25%		86%	1.3%	.21%	2,370
Farr, 1915	Hospital Wards	5 1.69%	19 6.42%	7 2.36%	145 48.99%	120 40.54%		296
McIver and Price, 1916	Hospital Wards				38* 26.39%	48* 33.33%	58† 40.28%	144
Bloedorn, 1917	Hospital Wards	74 2.74%			1,372 50.74%	1,258 46.52%		2,704
McPherson and Cohen, 1919	Army draftees	8 11.43%			20 28.57%	42 60%		70‡
Hubbard, 1920	Clinic, New York City				3.5 %	96.5 %		
Joyce, 1920	Hospital Wards	Of 2,300 cases treated 4/5 used heroin and the balance opium (smoking), morphin, laudanum and paregoric. 12.5% of heroin cases used cocain continuously and 5% used cocain occasionally.						
Bucher, 1920	Clinic, Los Angeles	12 2.26%			488 91.73%	32 6.01%		532§
Lambert, 1922	Private practise	40 2.51%	31 1.95%	19 1.19%	1,135 71.25%	140 8.78%	47 2.95%	1,593‖
Simon, 1924	City Police cases	876 10.75%			379 4.65%	6,982 85.83%		8,147

* Three more used both morphin and heroin.

† These 58 cases are mentioned by the authors but the form of drug used is not given.

‡ In addition 28 used heroin and "some other drug."—This report covers a study of Army cases.

§ In addition 18 used cocain, 10 used morphin and heroin and 10 used morphin and opium.

‖ Total also includes 89 morphin and alcohol, 36 morphin and cocain, 18 morphin and heroin, 17 codein, 1 dional, 9 cocain, 11 heroin and cocain.

Price, McPherson and Cohen, Hubbard, and Lambert certain influences which already have been covered in detail conduced inevitably to a selection in the types represented and these influences unquestionably account for the relative frequency of the opium preparations given in these series.

Other Classifications

Further statistical classification may not be attempted with the material available, however desirable it would be to determine the incidence of other factors having possibly important bearings on the problem under consideration, its prevention, and ultimate control. Especially valuable would be material dealing with the physical condition, the mental and ethical traits, occupation, environment, and education.

In what follows one or another of these groupings is mentioned and while the material is not numerically convincing, when considered as a whole, it may lead to certain justifiable conclusions.

A. Calkins—1871.[34]

"*In England,* the toilers in the smitheries, and the midnight relays at the factory-looms, are conspicuous. The unfortunates too, who find temporary refuge in the lying-in hospitals, as Dr. Reid declares, are often addicted to laudanum, and to spirits besides. Exemption in families appears to be determined as much by class-distinction, though not in precise correspondence, as in China.

"*In reference to Europe* at large no particular section appears to have caught the infection, unless France be accounted a partial exception. On the Continent no distinct class perhaps could be specified, unless perchance some of the cloistered brotherhoods. Paris, however, not to be behind in innovations, is said, on Tiedemann's authority, to have within her bounds an inaugurated society of opium-smokers (Opiophiles, as they style themselves), who have their nightly reunions, and a journal provided for the recording of any notable individual experiences.

"*Our home-classification* wears a very diversified aspect. Some get into the the habit fortuitously rather; others gravitate the same way, as if determined by some occult impulse. Prominent in the ranks are the squadrons of littérateurs (they 'of imagination all compact' included), such as live by brain-labor,—and especially those who execute their work by instalments more,—representatives of the professions, itinerating trumpeters of the Orator-Puff grandiloquent, lackadaisical idlers, who have forgotten the primeval rule as 'when Adam delved and Eve span,' wine-bibbers, who would fain discard an old acquaintance for an untried novelty, the lady of haut-ton, idly lolling upon her velvety fauteuil and vainly trying to cheat the lagging hours that intervene ere the 'clockwork tintinnabulum' shall sound the hour for opera or whist, the quasi-lady of the demimonde as well, whose life has been a vicissitudinous fluctuation between affluence and unconcern at the one extreme and mischance and anguish of spirit at the other, and whose hard fortune now is

---

[34] Calkins, A.—Opium and the opium appetite. Philadelphia. 1871.

"To know the light but by its parting smile,
And toil, and strive, and wish, and weep awhile;

and last, if last in order yet numerically outflanking all the rest, the invalid throngs as they course along, 'not in single files but in battalions,' to be amused anew and to be decimated over and over by noisy nostrum-mongers and braggadocio pseudomantists."

B. H. Hartwell—1889.[35]

Hartwell, in reporting upon the answers received to a circular sent to druggists throughout the state from whom replies representing 180 cities and towns were received, writes:

"What classes of people use opium in your community? 446 answers: 22 per cent, all classes; 22 per cent, middle classes; 7 per cent, upper classes; 7 per cent, lower classes; 11 per cent, do not know of any who use opium; 11 per cent, do not know; 20 per cent, miscellaneous."

Replies received from circulars replied to by 260 physicians representing 100 cities and towns are given by Hartwell as follows in answer to his question—"What classes of people mostly use it?"

"166 answers: 30 per cent, all classes; 22 per cent, higher; 3 per cent, middle; 6 per cent, lower; 12 per cent, middle and higher; 14 per cent, nervous women; 8 per cent, do not know."

T. C. Allbutt—1905.[36]

Allbutt, in his System of Medicine, says:

"Now, who are the persons who thus indulge themselves? The prompt answer will be—the neurotics. Who, then, are the neurotics? Are we not all neurotic nowadays? In a later chapter of this work I propose to discuss the subject of neurasthenia as a whole, and this I must not anticipate. I will repeat, however, what I have said on former occasions, that quickness and sensibility, acute perception and alert muscular reaction, are not morbid characters, but the qualities of high breeding. These qualities, however, become morbid when they are developed in relative excess in the lower ranges of sensibility, the higher qualities remaining at their former mean, that is, relatively in defect. Now that which in higher centers we call control, and in the lower inhibition consists in the reverse of this—in the cultivation of the higher planes of thought and sensibility, whereby the alertness of the lower is not diminished but transformed. Unfortunately disease may reduce a man to the level of those who had never known a higher state, and a man of mobile and sensitive fibre may thus for a phase become a neurotic; such a one may also become a morphinist under the pressure of pain or other distress, but he is not to be spoken of as constitutionally a neurotic. Again, not a few elderly persons have been under my care for sciatica, post-herpetic and other neuralgias, and the like, for whom morphine injections had been used; from such sufferers, however, this means must be firmly withheld, for it brings them into this dilemma, that while the rupture of the habit is in later life a graver stress, yet its continuance, by the cachexia it produces, is in them more quickly injurious to health than in younger persons. The establishment of a morphine habit in old people too often means an inevitable bondage, and shortened and fretful days.

---

[35] Hartwell, B. H.—The Sale and Use of Opium in Massachusetts. Annual Report Mass. State Board of Health. 1889. Vol. 20. pp. 137-156.

[36] Allbutt, T. C.—A system of Medicine. 1905.

"Another class of patients—not neurotic—presents itself to our consideration, namely, of those, young or old, who smitten by incurable and painful disease, expect no long span of life. Do we rightly encourage in these the use of the morphine syringe? That in some such cases, as of aneurysm, for example, the practice may be the lesser of two evil courses, may well be; but the solace is purchased at a heavy price. Whether pain soothed by less treacherous means be better, not only for the patient's friends but also for himself, than tearfulness, petulance, caprice, and a deterioration of character, which makes the death-bed scene of pettiness and exaction, rather than an example of fortitude and serenity, must be decided in the individual case. Too often a habitual resort to the drug, needed in increasing quantities, brings death of what is best in the man without euthanasia."

* * * * *

"Then comes the troop of those 'neurotics'—persons subject, perhaps, by nature to larger oscillations of nervous balance than the normal man—who scent intoxications from afar with a retriever-like instinct, and curious in their sensations, play in and out with all kinds of them; narcotics possess such folk almost by anticipation, and they often find less difficulty in the first tolerance than other people."

* * * * *

"One more group of morphinists and I have done. I refer to those who take morphine on small excuse, because it lies to their hand. Of these weak persons doctors and druggists form the majority; the rest are chemists and other men of science familiar with such means, who think in their folly that their technical knowledge will give them the use without the abuse of them."

G. P. Sprague—1907.[37]

Sprague from an etiologic point of view, divides persons suffering from morphinism into three groups:

---

[37] Sprague, G. P.—Some essential points in the etiology, pathology and treatment of morphine. Lancet-Clinic. 1907.

"First, a small one composed of normal individuals, who, from unwise treatment for pain in acute illness, have contracted the habit; a second, larger group of moral degenerates who indulge in the vice of morphinism; and a third and much the largest group, recruited from the victims of improper training and lack of early discipline; from the vast army of defectives who, beginning to lose ground in the race of life, resort to drugs as a spur, and from the large number who, suffering from sudden shock of disease, loss, etc., resort to the drug in the hope of obtaining relief. Granting these statements to be true, it follows that cause and symptoms in drug addiction are interwoven, and that a large majority of such patients are abnormal individuals, with whom the particular stimulant or sedative used is accidental, and dominates and masks the pre-existing and co-existing abnormality, in addition to adding an abnormality of its own."

C. W. Carter—1908.[38]

Carter states that morphin addiction does not respect age, sex, occupation, rank, race or vocation.

J. V. Shoemaker—1908.[39]

"There is a fundamental fact to be borne in mind in the treatment of this class of patients, as pointed out by Kellogg; it is that the majority of persons who acquire the vice of drug addiction are peculiarly constituted, and are either those who live entirely upon the sense-plane, whose highest aim is to gratify their appetites, and who, when the natural resources begin to fail, stimulate them with various drugs; or they belong to a class of neurotic, hypersensitive individuals, who are the products of the brain-destroying and race-deteriorating conditions of modern life. In such cases the drug treatment should be secondary to hygienic measures, particularly diet, massage, electricity, and hot or cold applications to the occiput and spine. Relapses in such individuals should not discourage the physician or the patient."

C. C. Wholey—1913.[40]

"Any individual may become addicted to the excessive use of narcotic drugs. The majority of my cases represent the average individual with the average heredity and environment. These persons have generally acquired their habit accidentally. It is, therefore, fallacious and unjust to refer without qualification to drug users as a class inherently neurotic and degenerate."

He also comments as follows on certain types observed but does not speculate as to the proportion which they form of the whole number of opium users:

---

[38] Carter, C. W.—The nature of the morphine disease. Lancet-Clinic. 1908.

[39] Shoemaker, J. V.—Materia Medica and Therapeutics. 1908.

[40] Wholey, C. C.—Psychopathologic phases observable in individuals using narcotic drugs in excess. Penn. Med. Jour. June, 1913.

"There are many individuals whose powers of resistance, by reason of inheritance and environmental factors, are merely sufficient to enable them to maintain a healthy balance. They have enough nerve stability to carry them through an efficient life provided no exceptional strain is placed upon them. When such persons come into contact with narcotizing drugs, their delicate balance is likely to be overthrown; the nervous organism has no reserve with which to meet the added demand made upon it by the inroads of the drug. These individuals are not necessarily neurasthenic; they have been endowed with no more endurance than the ordinary routine of each day would demand."

* * * * *

"There is another individual who is congenitally just short of the balance which the above person normally possesses. This individual is inherently neurotic. His nerve endowment is not quite sufficient to enable him to live from day to day comfortably and effectively. He will, therefore (a mere biologic incident in his struggle for self-preservation), desperately grasp at whatever seems to aid his own inadequate efforts. When drugs come his way, with their seeming power to increase his flagging energy, or to bring peace and order into his turbulent, chaotic, harassed existence, it is inevitable that he shall anchor himself by their use. Those are individuals whom physicians should particularly safeguard; it is hazardous for them even once to experience the soothing influence of an opiate."

In addition to the above, Wholey states that there are a few fairly well-defined types, distinctly pathologic, who seem especially likely to become drug users, as the cyclothymiac, emotionally unstable individuals alternately depressed and elated. This class, he believes, represents various shadings within the group of borderland cases showing manic-depressive characteristics.

Another pathologic type, the author continues, is that known as the constitutionally immoral, with undeveloped moral and ethical sense, impatient and with lack of endurance for physical or mental discomfort. In this class are the ne'er-do-well, the tramp, petty thief, prostitute, etc.

Closely associated with the preceding, he says, there are certain distinct types which must be clearly differentiated. One is the high-grade imbecile, another the heboid often difficult to recognize, and frequently a precursor of dementia praecox.

These types must be carefully differentiated, the author believes, in order to deal intelligently with drug addiction. He states:

"The cyclothymiacs and the constitutional immorals possess an anomalous make-up which often precludes the possibility of cure. They drift from institution to institution, relapsing again and again; the hopeless picture presented by these persons, really mental cases, has done much to create practically universal skepticism regarding cure for drug addiction."

P. M. Lichtenstein—1914.[41]

The following by Dr. Lichtenstein is the result of observation of 1,000 cases admitted to the City Prison, Manhattan:

"As regards occupation, the cases observed and treated by me showed that the employment of habitués required little effort and gave them plenty of leisure time. The occupations given were as follows in the order named: Salesmen, clerks, newsdealers, truck drivers, actors, stenographers, waiters and waitresses, and cooks. I have found very few who gave a history of performing very laborious work.

"Among the women, in the order named, the occupations were actresses, nurses and saleswomen. Most of these had been arrested for soliciting, keeping disorderly houses, or shoplifting. The social standing of habitués is an interesting item. The greater number are of the gangster type and consequently are mental and moral degenerates. It is surprising, however, to learn how many habitués are of the better class. Physicians, nurses and actresses, also some of the very richest of our people, frequently have elaborate 'lay-outs' in their homes, richly furnished, and stocked with the handsomest jeweled opium pipes. Many of these people naturally never attract our attention because of the absence of marked physical changes, due to good surroundings, good meals, etc."

S. Block—1915.[42]

"Normal persons will never become drug habitués. This is one other phase of the subject we must not overlook. The author has found it convenient to divide all cases into two great groups: first, those whose trouble is like a neurasthenia, if there is such a sickness; second, those who have a definite hysteria. Most of the cases belong to the hysterical class. These are treated like any other hysterics, and the certainty of permanent cure is the same. The main point is to make a careful study of the case, why and how the habit started, what physical affections have been wrought, etc. In short we must try to make a diagnosis beside recognizing a mere symptom that the layman knows as well as his doctor. Many cases of major hysteria are cured by suggestion in some form, many are only temporarily cured, and this is true of drug fiend cases. Likewise, as many cases of stuttering or other hysterical phenomena are acquired by imitation, so it is with these cases.

"In the neurasthenic type, as in other neurasthenias, we have the feeling of unrest, the desire for something not at hand, pessimistic unhappiness, inability to concentrate on any subject, seeing only the dark side of life. Like any neurasthenia it may originate from a series of misfortunes, real or imagined.

---

[41] Lichtenstein, P. M.—Narcotic Addiction. New York Med. Jour. November 14, 1914.

[42] Block, S.—Drug Habitués. New York Med. Jour. February 27, 1916.

These people become self-conscious, shun society, threaten suicide, take big chances on important undertakings, and seek unnatural means to appease their terrible feelings. In despair they begin the use of drugs to get oblivion, having read or having been told of a feeling of well being following their use. How often are we told of the drunkard trying to 'drown his sorrow'."

D. K. Henderson—1916.[43]

"There seems to be very little doubt but that the vast majority of those unfortunate individuals who use drugs to excess are constitutionally unstable, poorly balanced, and psychopathic; they react to the difficulties and conflicts of their lives by becoming drug habitués. There are a few, especially those addicted to opium and morphine, who on the other hand, to start with may be fairly sound constitutionally, but who, on account of definite physical disorders usually of a painful nature, have had a narcotic prescribed by their physicians, and experience such blessed relief that even although they have only been taking small doses they gradually and insidiously come more and more under its influence, and ultimately find that they are quite unable to do without it."

* * * * *

"The majority of those who use this drug are the lowest of the low, and if anything are more vicious and more degenerate than those addicted to other forms of drug habituation. The above statement may, I think, to a certain extent be vouched for by the fact that the majority of those applying for treatment for heroin addiction are mere youths varying in age from 17 to 28 years, the average age for a series of nineteen cases being 20 years. In contrast, the average age of a series of fifteen cases of morphin addiction was 36 years, and the average age of a series of sixteen cases of alcoholism was 34 years. The above contrasts may be made still more striking when it is remembered that the devotees have usually been taking the drug for a number of years before they apply for treatment, so that there is no doubt that a good many of the heroin cases start taking the drug when they are only about 14 or 15 years of age."

J. McIver and G. E. Price—1916.[44]

McIver and Price, reporting on a study of a series of cases at the Philadelphia General Hospital, state:

"In considering the question of degeneracy, signs of arrested development, such as abnormalities in the shape and size of the ears and palate, irregularities in the arrangement of the teeth, abnormally shaped heads and marked facial asymmetry, were carefully studied. Of the 147 patients, fifty-nine, or 40 per cent, presented one or more of these stigmata to a well-marked degree.

"Some writers have emphasized the fact that 'neurotics' tend to acquire the cocain habit rapidly and Block says that 'Normal persons never become drug habitués.' While we believe that Block's contention is true as regards the majority of drug addicts, our observation is that normal persons may and do become habituated to the use of morphin through taking it over a considerable period of time for the relief of pain or insomnia; however, these patients, should the cause be removed, offer the best prognosis."

---

[43] Henderson, D. K.—The treatment of drug addiction. Glasgow Med. Jour. 1916.

[44] McIver, J. and G. E. Price—Drug Addiction. Jour. Amer. Med. Assn. Feb. 12, 1916.

F. X. Dercum—1917.[45]

"We must remember that one who acquires drug addiction is usually not a normal individual. Frequently he is hereditarily neuropathic. Often we note in their family history alcoholism, nervous breakdowns or actual psychoses. The inheritance of ready exhaustion, depression, of a neuropathic make-up generally plays a rôle in some cases.

"The organization which leads to morphinism and cocainism does not differ essentially from that which leads to alcoholism."

W. A. Bloedorn—1917.[46]

Bloedorn, in a study made of cases in Bellevue Hospital, New York, says:

"An examination of these cases at close range does not bear out the statement often made that drug addicts belong to the so-called criminal class. It is true that when the drug has come to be a necessity for the addict the importance of obtaining enough of it every day overshadows everything else in his life, and in order to obtain the drug he has little hesitancy in lying or stealing. These traits are developed and become engrafted in the direct proportion that they become necessary to secure the desired relief and are not the result of inherent criminal tendencies. In other words, the individual is not an addict because he has criminal tendencies but rather he develops criminal tendencies because he is an addict."

* * * * *

"There is a tendency to surround drug addicts with an air of mystery, to regard them as a peculiar class, to ascribe to them numerous vices and few virtues and to set them apart from their fellowmen as being a distinct type. But when we attempt to describe this type we find that we are describing an individual and not a class. There is no justification for the mystery which has been allowed to creep in and hover about the drug addict. It is easy to dispose of these cases by consigning them to the so-called criminal class, or the class of defectives, but when we come to examine them individually and at close range we find increasing numbers who do not fit into these special classes. The term 'moral delinquent' has come to be applied to the drug addict and while there is justification for this term it really is only a synonym of drug addict and does not serve to throw any considerable light on the class as a whole."

---

[45] Dercum, F. X.—Relative frequency of drug addiction among middle and upper classes, treatment and final results. Penn. Med. Jour. Feb. 1917.

[46] Bloedorn, W. A.—Studies of drug addicts. U. S. Naval Med. Bull. XI No. 3. 1917.

* * * * *

"The Binet test was also a part of the examination in all cases and while the series is not yet completed it is evident that drug addicts cannot be classed as mental defectives. While, naturally, some were found who fell below the 15-year test at least 80 per cent. answered all tests applied and showed no evidence of being mentally backward."

Joint Legislative Committee, New York—1917.[47]

"It has further been stated by competent authorities before your Committee that drug addiction is not confined to the criminal or defective class of humanity.

"This disease, however contracted, is prevalent among members of every social class."

F. H. Carlisle—1917.[48]

Carlisle states that individuals too poorly equipped mentally fully to appreciate the dangers of continued use of the drug, moral delinquents whose addiction is engrafted on an unstable moral and mental make-up, and individuals of criminal tendencies constitute about twenty-five per cent of admissions and reduce the number of favorable results of treatment in like proportion.

C. L. Dana—1918.[49]

"Most addicts are constitutionally unstable persons, likely to be a burden or a menace to society anyway.

"Drug addiction does not lead to insanity or the serious psychoses needing custodial care. The percentage of such cases in State hospitals is very small. It is very large, however, in prisons and reformatories and it would seem as if drug addiction had more relations to crime and social waste than to psychiatry.

"The drug addict is not usually a mental defective, and a series of intelligence tests would not disclose large percentages of morons and imbeciles, as happens in certain other anti-social groups."

G. D. Swaine—1918.[50]

"In Class one, we can include all of the physical, mental, and moral defectives, the tramps, hoboes, idlers, loafers, irresponsibles, criminals, and denizens of the underworld, and, among women, the idle rich, who began taking the drug for the intoxication it produces and have kept it up until they have become slaves to its devilish power. And, all these do not want to be cured. If forced to take treatment, they may be cured, but, they almost always relapse. In these cases, morphine-addiction is a vice, as well as a disorder resulting from narcotic poisoning. These are the 'drug-fiends.'

---

[47] Preliminary Report of Joint Legislative Committee appointed to Investigate and Examine the Laws in Relation to the Distribution and Sale of so-called Habit-forming Narcotic Drugs. Feb. 19, 1917.

[48] Carlisle, F. H.—Drug Treatment of Morphinism. Boston Med. & Surg. Jour. Feb. 8, 1917.

[49] Dana, C. L.—Problems of drug addiction. Med. Rec. Feb. 2, 1918.

[50] Swaine, G. D.—Regarding the luminal treatment of morphine addiction. Amer. Jour. Clin. Med. 1918.

"In Class two, we have many types of good citizens, who have become addicted to the use of the drug innocently and who are, in every sense of the word 'victims.' Morphine is no respecter of persons, and the victims are doctors, lawyers, ministers, artists, actors, judges, congressmen, senators, priests, authors, women, girls, all of whom realize their conditions and want to be cured. In these cases, morphine-addiction is not a vice, but, an incubus, and, when they are cured they stay cured."

C. B. Pearson—1919.[51]

Pearson says that the degenerate type is the one who has given the morphin addict a much worse reputation than he deserves and is the one always in evidence. The better type is not, for he is not suspected of being an addict. It is among this latter class that we get our highest percentage of permanent cures and this is also the part of our work most likely to remain unknown.

The straight morphin addict, he says, rarely becomes a degenerate.

"So far as my experience goes I have yet to see my first case. The causes of degeneracy among morphine addicts are the immoderate use of alcohol, mixed drug taking, syphilis of the nervous system, the repeated attempts at heroic treatment that end in failure, or repeated shocks due to abstinence from the drug from any reason, viz., imprisonment, or accidental separation from the source of supply due to lack of funds or any other reason. I have seen a number of morphine addicts who were mixed drug takers, who also used alcohol to excess and who were also syphilitics, who had not yet reached the point of degeneracy. However, I believe this combination will produce degeneracy if given time enough in every case. I do not mean by this that morphine is not one of the causal factors of degeneracy in the latter type of cases. While morphine acting upon one who lives a normal hygienic life in all other respects has not in my experience proved to be sufficient to cause degeneracy we can readily see that the case may be different when the drug acts upon an individual whose power of resistance is being or has already been broken down by the excessive use of alcohol, cocaine, chloral hydrate or other powerful hypnotics, syphilis, the repeated shocks of mistaken methods of treatment, even if only one of these factors is working with the morphine. But when all are combined degeneracy cannot be far away. However, it is really surprising how long some of them bear up under all these factors of degeneracy and still retain a fair degree of mental and moral integrity for some time."

---

[51] Pearson, C. S.—A study of degeneracy as seen among addicts. New York Med. Jour. Nov. 15, 1919.

T. S. Blair—1919.[52]

"Morbid and unstable individuals who become drug addicts are the 'horrible examples' held up too much to public view and reprobation. It is not true that all drug addicts, nor even one-fourth of them, ever become such creatures as are depicted in fiction."

* * * * *

"And it must be admitted as a fact in therapeutics that there are many opium addicts who are not casually recognized as such, even though for years addicted. This is not said in defense of opium addiction, but acknowledged as a fact that must be properly evaluated."

* * * * *

"We are listing the drug addicts as follows:

Pure addicts. They should be cured.
Addiction with curable disease. This is a clinical problem.
Addiction with incurable disease.
Addiction in the aged, which is hard to cure."

M. C. Mackin—1919.[53]

Mackin, writing of cases treated by the State Hospital for Inebriates, Knoxville, Iowa, 1919, says:

"According to Pouchet, forty per cent. of our morphinists are physicians, and the wives of physicians also constitute a considerable percentage. Besides physicians, druggists often become addicts.

"Morphinism, as a rule, affects those hereditarily tainted, who have less stamina to oppose the continued use of the drug. This would be hardly fair to the medical profession to accuse such a large percentage as being hereditarily tainted and the statistics of the State Hospital of Inebriates at Knoxville on this question are at a decided variance with statistics of Pouchet. Our hospital shows that less than two per cent of those admitted were physicians."

Special Committee of Investigation appointed by the Secretary of the Treasury—1919.[54]

" . . . the Committee finds that addicts may be divided into two classes, namely, the class composed principally of the addicts of the underworld and the class which is made up almost entirely of addicts in good social standing."

---

[52] Blair, T. S.—Narcotic drug addiction as regulated by a state department of health. Jour. Amer. Med. Assn. May 17, 1919.

[53] Mackin, M. C.—Morphine addiction. Bull. Iowa Inst. 1919.

[54] Traffic in Narcotic Drugs—Report of Special Committee of Investigation appointed by the Secretary of Treasury. March 1918.

Under the heading "Effect of addiction on morals," the Committee reports:

"From information in the hands of the Committee, it is concluded that, while drug addicts may appear to be normal to the casual observer, they are usually weak in character and will, and lacking in moral sense.

"The opium or morphine addict is not always a hopeless liar, a moral wreck, or a creature sunk in vice and lost to all sense of decency and honor, but may often be an upright individual except under circumstances which involve his affliction, or the procuring of the drug of addiction. He will usually lie as to the dose necessary to sustain a moderately comfortable existence, and he will stoop to any subterfuge and even to theft to achieve relief from the bodily agonies experienced as a result of the withdrawal of the drug. There are many instances of cases where victims of this disease were among the people of the highest qualities morally and intellectually, and of the greatest value to their communities, who when driven by sudden deprivation of their drug, have been led to commit felony or violence to relieve their misery."

S. E. Jelliffe and W. A. White—1919.[55]

"The habitual use of opium in some form has become common among all classes in society. The same thing may be said with reference to the reasons for taking opium as has been said with reference to alcohol. The opium habitué is a person primarily of neuropathic taint, the mere opium taking or the symptoms it produces being but surface indications of the real trouble."

G. E. McPherson and J. Cohen—1919.[56]

Based on their survey of 100 cases of drug addiction entering Camp Upton, N. Y., via the draft, 1918, McPherson and Cohen report that the mental-age ratings secured by the Stanford-Binet, Point-Scale, Performance-Scale, and Beta Tests indicate that the intellectual level of drug addicts appearing before the Recruit Medical Examining Board does not vary strikingly from that of normal draftees.

J. H. W. Rhein—1920.[57]

"Any effort to correct the evils of drug addiction must be based on a thorough understanding of the psychologic factors underlying the cause. I do not believe that mental deficiency is a cause of drug addiction, nor do I believe that the proportion of mental defectives is high among drug addicts. I believe that improper prescribing of opium, morphin or heroin by physicians, while responsible in some degree, is only incidental in drug addiction. I mean by this that the cause of development of the habit is inherent in the individual. The drug addict is a psychopath before he acquires the habit. He is a person who cannot face, unassisted, painful situations; he resents suffering, physical, mental or moral; he has not adjusted himself to his emotional reactions. The most common symptom that requires relief is a feeling of inadequacy; an inability to cope with difficulties. These conditions call for an easy and rapid method of relief which is found in the use of drugs. It is simple enough to cure the victim of his craving temporarily, but the difficulty is in preventing a return to the habit. To cure a drug addict means to reconstruct and re-educate his personality so that he can adapt himself to his emotional reactions."

---

[55] Jelliffe, S. E. and W. A. White—Diseases of the Nervous System. 1919.

[56] McPherson, G. E. and J. Cohen—Survey of 100 cases of drug addiction entering Camp Upton, N. Y., via draft 1918. Boston Med. and Surg. Jour. June 5, 1919.

[57] Rhein, J. H. W.—Discussion in "The Doctor and the Drug Addict." Symposium Philadelphia County Medical Society. Reviewed in Jour. Amer. Med. Assn. Dec. 4, 1920.

T. F. Joyce—1920.[58]

Joyce, writing of cases treated at Riverside Hospital, New York, and for the most part sent there by the New York City clinic, says:

"Drug addicts may be divided into two general classes. The first class is composed of people who have become addicted to the use of drugs through illness, associated probably with an underlying neurotic temperament. The second class, which is overwhelmingly in the majority, is at the present time giving municipal authorities the greatest concern. These people are largely from the underworld or channels leading directly to it. They have become addicted to the use of narcotic drugs largely through association with habitues and they find in the drug a panacea for the physical and mental ills that are the result of the lives they are leading. Late hours, dance halls, and unwholesome cabarets do much to bring about this condition of body and mind and in a great many cases these people are found far below the standard mentally."

S. D. Hubbard—1920.[59]

Hubbard, describing the work of the New York City Narcotic Clinic, says:

"There are drug addicts constitutionally inferior, and superior; feeble minded, and strong minded; physically below, and above par; morally inferior, and superior. No one class of society seems, in our experience, to enjoy a monopoly in this practice."

Further on he says:

"It has been said that the experience in the Department of Health emergency narcotic clinic was unique; that the character of the addicts visiting this service was very exceptional. Possibly our experience dealt with an unusual feature of this problem, but from personal consultations with many acknowledged addicts—in all walks of life—journalists, ministers, writers, physicians, clergymen, teachers, business men, etc., seeking interpretation of the law's requirements, as it affected them individually—they being addicts—we naturally had an opportunity for first-hand information."

---

[58] Joyce, T. F.—Treatment of Drug Addiction. N.Y. Medical Jour. Aug. 14, 1920.

[59] Hubbard, S. D.—The New York City Narcotic Clinic and differing points of view on narcotic addiction. Monthly Bull. Department of Health, City of New York. Feb. 1920.

Later he writes:

"We feel that we have had an unusually wide and peculiarly general experience with drug addicts of all classes—classes so large as to make us think that others' experience in this form of practice has not been nearly so extensive."

Unfortunately Dr. Hubbard, though mentioning in the second paragraph above that among others, writers, clergymen, teachers, and business men constitute some of the occupations represented among users of narcotic drugs, fails to mention any of these occupations by numbers in his occupational classification of the patients treated at the clinic as listed at the end of the same article.

In another article in the same year, Hubbard[60] classifies drug users as follows:

"The habitual users of narcotic drugs may be divided into two general classes:—(1) Those who suffer from a disease or ailment requiring the use of narcotic drugs and (2) addicts—dope fiends—drug habitués; those who use narcotic drugs for the comfort these afford and solely by reason of an acquired habit. The Harrison Narcotic Law (U. S. Supreme Court, Doremus and Webb cases) says that drugs may not be given to keep the users comfortable by maintaining their customary use.

Class 2 may be divided further:

(a) Correctional (underworld type).
(b) Mentally defective (the constitutionally inferior person or the individual with feeblemindedness).
(c) Social misfits (the person whose maladjustment does not permit him to conform to social customs).
(d) Fortuitous (the individual who has had an adequate reason for taking narcotics, but the reason has disappeared and the drug habit is continued because of the physical suffering which unaided deprivation brings).

Many addicts loathe their habit, but physically cannot break from it unaided. A number of addicts, especially those in class 2, subdivision (a), use the practice of drug indulgence in their jobs. In our experience in drug addiction in New York City we found that those in subdivisions (a) and (b) were mostly heroinists, while the morphinists were in (c) and (d). The heroinist and morphinist have been thus differentiated by an outspoken physician: The morphinist has guts, while the heroinist has only bowels."

---

[60] Hubbard, S. D.—Some fallacies regarding narcotic drug addiction. Jour. Amer. Med. Assn. May 22, 1920.

* * * * *

"The addict is not always a hopeless liar or a moral wreck or a creature sunk in vice and lost to all sense of decency and honor, but was frequently in our experience an upright person except as concerned his affliction or the procuring of the drug of his affliction. Addicts lied about dosage; but when they found that the game was 'on the level' they would voluntarily admit deception and tell what they were actually taking.

"When it is considered how these creatures were hounded and imposed on by illicit prescriber and dispenser, as well as how they endeavored to escape police detection and family discovery, it was natural to meet some peculiar situations; but when sanctuary was assured, they calmed down and became friendly and communicative, and in many instances helped the officials to aid them in getting rid of their habit. Most of them when freed are anxious to remain free. I have been assured of this so often by addicts who have been off the drug and whom I have followed up that I make this statement advisedly and with positive assurances that many of our cases are off the drug for good, provided all temptation is removed. There were many instances in our experience in which the victims of this condition were persons of the highest qualities, physically, morally and intellectually, and some held high positions of authority and responsibility. One is a signalman who for twenty-five years has been addicted, yet has not missed a day from work and has never been reported for any company infraction, and, strange to relate, his superior officer was wholly unaware of his misfortune. This man took the cure and returned to his position, and for the last six months has been off the drug.

"The correctional class I do not desire to discuss here, as the subject is one which merits special and lengthy consideration. The underworld addict is grossly misunderstood. While drug indulgence has been held accountable for his unmoral character, those whom I have had opportunity to study show degeneracy incident to association and environment, and addiction only as a secondary expedient for stimulating nerve energy and drowning painful reminiscences."

Hobart A. Hare—1920.[61]

Hare in discussing Lambert's article entitled "Scope of Therapeutics in the Relief of Narcotism" at a symposium of the Philadelphia County Medical Society, says his experience has shown that there are two classes of addicts: (1) Those fundamentally rotten by inheritance, and (2) those not fundamentally rotten, "but men and women, like any one of us, who, through illness, have come to be dependent on morphin, codein or possibly even heroin." He says these people are easily cured and separate themselves from the true morphin habitué who does not want to be cured. There is a difference in the morale and courage of the two classes. Twenty years ago, he says, he did not have much faith in the cure of morphinism, but experience has taught him that many people who have slipped into addiction through chronic painful maladies as bladder and pelvic troubles can with a little care be cured.

---

[61] Hare, H. A.—Discussion in "The Doctor and the Drug Addict." Symposium Philadelphia County Medical Society. Reviewed in Jour. Amer. Med. Assn. Dec. 4, 1920.

American Medical Association—1920.[62]

At the 1919 meeting of the House of Delegates, American Medical Association, a special committee on the question of narcotics was appointed consisting of Dr. E. Eliot Harris, Chairman; Dr. A. T. McCormack, Dr. Paul Waterman, Dr. Alexander Lambert, ex-officio. So far as we have been able to determine this was the committee which reported in 1920:

"We think it is also apparent that the habitual users of narcotic drugs may be divided into two classes. In Class 1 we shall place all those who suffer from a disease or ailment requiring the use of narcotic drugs, such as cancer, and other painful and distressing diseases. Patients in this class are legitimate medical cases, and the physician should be ever mindful that his patient should protect him by not sharing the drug with others.

"After excluding Class 1, we have left for consideration those who are addicts—those who use narcotic drugs for the comfort they afford and continue their use solely by reason of an acquired habit. In this class we have those who are suffering from a functional disturbance with no physical basis expressed in pathologic change. . . ."

* * * * *

"We turn to the consideration of the persons classified as addicts after excluding all those who suffer from a disease calling for the use of narcotic drugs, and with the conviction that we are dealing with functional conditions for which the remedy is the withdrawal of the drug. On the basis of the testimony we have submitted in this report we suggest the following subdivisions of Class 2, in which we include addicts as just defined:

1. Correctional cases
2. Mental defectives
3. Social misfits
4. Otherwise normal persons."

A. Lambert—1920.[63]

"While the psychoneurotic and the inadequate personality break down more completely under the mental conflicts and strains of life and resort more quickly to narcotism than normal persons, all morphin users are not of this type. Many are normal personalities of more than average intelligence and realize fully their positions and their progressive degeneration. Such individuals are really filled with remorse and resent the stigma which is placed upon them for a habit for which they are often not responsible."

---

[62] Report of the Committee on the Narcotic Drug Situation in the United States. American Medical Association. Jour. Amer. Med. Assn. May 8, 1920.

[63] Lambert A.—In: Nelson's Loose-Leaf Medicine. 1920.

* * * * *

"It has often been stated, both in lay and medical writings, that the purely physical cravings for narcotics is directly inherited. This today is a discarded theory, as the facts do not bear it out. The craving is only physical when recovering from over indulgence. The so-called craving is always an emotional impulse often over-powering the so-called will even against the judgment and reasoning endeavors of the personality to resist. Feeble-mindedness is inherited. The weak-willed self-indulgent personality, prone to excess in all things, is inherited. The self-conscious, introspective personality, unable to stand the hard knocks of life, is a personality often transmitted from parent to offspring. . . . In these psychoneurotic individuals, alcohol and drug addiction is but the expression of the desire for relief from a strain which cannot be borne."

E. S. Bishop—1920.[64]

"It is a fact that the narcotic drugs may afford pleasurable sensations to some of those not yet fully addicted to them, and that this effect has been sought by the mentally and morally inferior purely for its enjoyment for the same reasons and in the same spirit that individuals of this type tend to yield themselves to morbid impulses, curiosities, excesses and indulgences. Experience does not teach them intelligence in the management of opiate addiction and they tend to complicate it with cocaine and other indulgence, increasing their irresponsibility and conducing to their earlier self-elimination.

"Wide and varied experience, however, hospital and private, with careful analysis of history of development, and consideration of the individual case, demonstrates the fact that a majority of narcotic addicts do not belong to this last described type of individuals. It will be found upon careful examination that they are average individuals in their mental and moral fundamentals. Among them are many men and women of high ideals and worthy accomplishments, whose knowledge of narcotic administration was first gained by 'withdrawal' agonies following cessation of medication, who have never experienced pleasure from narcotic drug, are normal mentally and morally, and unquestionably victims of a purely physical affliction."

* * * * *

"The idea that narcotic drug addiction should be accorded a basis of weakness of will—neurotic or otherwise, inherent or acquired—and should be classed as a morbid appetite, a vice, a depraved indulgence, a habit, has been generally unquestioned and the prevailing dogma for many years. It is very unfortunate that we have paid so little attention to material facts and have made so little effort to explain constant physical symptomatology on a basis of physical cause, and that there has not been a wider recognition and more general acceptation of scientific work that has been done."

---

[64] Bishop, E. S.—The Narcotic Drug Problem. 1920.

L. H. Neff—1921.[65]

"The habitual drug user is a neurotic, and the fundamental traits of this condition are dominant factors in his personality or make-up; this inefficiency, a constitutional inferiority, antedates the drug taking which may be rightly considered an expression or mannerism of the defect."

Further,

"approximately 70 per cent of all cases of drug addiction are frank cases purely anti-social, without a criminal history; the remaining 30 per cent are irresponsible and vicious, and may properly be classed as criminal recidivists."

American Public Health Association—1921.[66]

A special committee of the American Public Health Association consisting of Roger D. Perkins, M.D., Chairman, George W. McCoy, M.D., and Peter H. Bryce, M.D., reporting in 1921, includes the following classification in its report:

"The group of addicts variously spoken of as criminals, degenerates and feeble-minded is unwilling and unable to co-operate in the necessary treatment, and should be kept under official control. In the opinion of your Committee, the control of this group is essentially a police problem.

"The group of addicts who suffer from physical conditions necessitating an indefinite continuance of their use of the drug constitutes a medical problem.

"Furthermore, the group of addicts in whom the clinical condition, which was the reason for beginning the use of the drug, no longer exists, or who began the addiction for other than clinical reasons, is also a medical problem."

Lawrence Kolb—1925.[67] [68]

The author calls attention to the widespread popular belief that narcotic drug addiction in recent years has been responsible for much violent crime; also to the imagined increase of addiction among criminals from the publication of unexplained prison figures showing an increase in the number of addicted prisoners. An intensive psychiatric and personality study of 225 cases brought out, he states, the fact that in the vast majority of cases the addict was a criminal before he became addicted, and that ". . . no opiate ever directly influenced addicts to commit violent crime . . ." His findings and deductions follow:

---

[65] Neff, L. H.—The case of the drug addicts. Jour. Mich. State. Med. Soc. March 1921.

[66] Report of Committee on Narcotic Drug Addiction. American Public Health Association. Amer. Jour. Pub. Health. December. 1921.

[67] Kolb, Lawrence—Drug addiction in its relation to crime. Journal of Mental Hygiene. January, 1925. Vol. 9. No. 1. pp. 74-89.

[68] Kolb, Lawrence—The relation of intelligence to the etiology of drug addiction. Amer. Journal of Psychiatry. July, 1925. Vol. 5. No. 1. pp. 163-167.

> "In so far as its influence on crime is concerned, addiction to opium or any of its preparations creates two tendencies directly opposed to each other. The immediate effect of excessive indulgence in all forms of the drug is to soothe abnormal impulses, while the ultimate effect is to create a state of idleness and dependency which naturally enhances the desire to live at the expense of others and by anti-social means. The effect of addiction on the psychopathic murderer is to inhibit his impulse to violent crime. At the same time it saps his vitality and reduces the ambition and courage that prompt him to convert his abnormal impulse into action. He, therefore, becomes less a murderer and more a thief. In other cases, where the degree of abnormality is not so great, the indirect effect is to increase the impulse to lie and steal. The factor most important in this is the desire to secure the drug in order to avoid the discomfort caused by the lack of it. No addict who receives an adequate supply of opium and has money enough to live is converted into a liar or thief by the direct effect of the drug itself. The direct effect is to remove the irritability and unrest so characteristic of psychopathic individuals. The soothing effect of opiates in such cases is so striking and universally characteristic that one is led to believe violent crime would be much less prevalent if all habitual criminals were addicts who could obtain sufficient morphine or heroin to keep themselves fully charged with one of these drugs at all times."

In the case of cocain, the author says that up to a certain dose, it increases confidence and courage, but beyond this point it produces uncertainty, fear, and anxiety. A criminal who takes cocain is, he says, more efficient as a criminal unless he takes too much. The drug does not arouse criminal impulses in anyone, but enhances the criminal's mental and physical energy.

He continues:

> "The soothing effect of opium on abnormal impulses is believed to be well understood by the medical profession. It was correctly stated by Norman Kerr more than thirty years ago in the phrases, 'Opium soothes, alcohol maddens,' and 'The intoxicated by opium are serene, sedate, and lethargic,' but it needs to be restated because of the misapprehension produced partly by lack of analysis of the statistics on the increased number of addicts in prison in recent years. The effect of heroin in particular needs to be set forth in its true light, because of the alarm created by certain persons, who without a thorough

understanding of it, have seized upon and misinterpreted the phrase 'inflation of personality' used in describing one effect of opiates, and out of it have constructed the heroin hero.

"The mental and physical lethargy and the loss of ambition produced by morphine and heroin are incompatible with the simultaneous production of an aggressive hero. These effects are spoken of by all addicts who use these drugs in large quantities. The inflation of personality in inferior individuals actually occurs. In the present series of cases, 86 per cent. were nervously abnormal before they became addicted. A large proportion were psychopathic, and every criminal among them had committed crime before the use of narcotics was begun. All of these cases became addicted because of the pleasurable mental satisfaction that the first few doses of a narcotic gave them. The degree of inflation varied in direct proportion to the degree of pathology. It occurred only slightly or not at all in those considered nervously normal, but was very striking in some of the extreme psychopaths.

"One of the effects of opium is the obliteration of mental conflicts and of the uncomfortable pathological strivings that result from them. The tensions, both physical and mental, produced by these strivings are relieved, and under its influence the neurotic or psychopathic patient feels free, easy, and contented. The contrast with his usual state is so great in some cases that he is actually happy. The condition may be expressed in another way by saying that the patient has sublimated his pathological impulses by the use of a narcotic. The objection to this form of sublimation is that it is itself temporary and pathological. The reflex from waning narcotism accentuates the original tensions, just as release from these tensions accentuates the pleasure of narcotics beyond normal expectations, and in the end the patient is worse off. The depression that so often follows the withdrawal of opium is in part explained in this way.

"The point that it is desired to settle is: Does the so-called inflation of personality cause any one subject to it to commit crime while in the inflated state? The cases under discussion clearly show that exactly the reverse of this is true. In nearly every instance where the drug has been taken in large quantities by a morose, irritable, restless, discontented individual, the inflation for the time being has made him agreeable, pleasant, and non-aggressive. The effect on less pathological individuals is similar, but less in degree. It is, in fact, the pleasant satisfaction with things as they are that causes addicts to lose ambition and will power. Addiction to opium will not prevent criminals from committing violent crimes—the inflation is too temporary to bring about such a good result, and when tolerance is established, the effect is diminished in intensity—but the drug in large doses does inhibit aggressive impulses of every kind, and the effect on an aggressive criminal is to make him less a murderer and more a thief. Under the influence of morphine or heroin, the addict suffers in courage and pride because, when his personality is inflated, everything is satisfactory and nothing matters.

"Although the inflated state tends to lessen the tendency to crime, there is a possibility that persons inflated to an extreme degree could be led to commit murder or robbery. One intelligent, but highly abnormal patient who derived intense pleasure from narcotics described an exquisite 'don't-care, fatalistic state' into which several hours of excessive indulgence in cocaine and morphine or cocaine and heroin raised him. There was, he admitted, a certain stage of short duration in his debauches during which, through suggestion, he might have been led to commit violent crime because of his peculiar attitude that nothing mattered, but during this stage there was no ambition or spontaneous impulse to do anything. Another patient, a shrinking, temperamental neurotic, described a cocaine-heroin spree that lasted a week, during which time he would consume an ounce of each of these drugs while lying in bed oblivious of the passage of time and in a state of happiness approaching ecstasy. He had no will power or ambition to do anything during these sprees, but was no doubt highly suggestible. These two cases exemplify an extreme state of inflation during which a certain type of addict is suggestible, but lacking in ambition and aggressiveness. It is reasonable to suppose that such cases could be influenced to commit murder while in the inflated state, but the soothing effect of narcotics far outweighs in importance the suggestibility they produce under some circumstances, and neither of the suggestible states above referred to is comparable in danger with the aggressive, maddening influence of alcohol on certain types of individuals.

"The effect of morphine and heroin in reducing courage and aggressiveness is illustrated by statements of addicts examined, as well as by the testimony of their relatives and friends. The experience of the wife who said she could turn her husband around her finger when he was under the influence of heroin, but that at other times he was irritable and disagreeable, is paralleled by numerous other cases illustrated by quotations from the remarks of addicts given below:

"'If there is any yellow in you, heroin will bring it out.'

"'A man can slap you in the face and you would not resent it.'

"'It would be impossible to commit a crime, but you do dirty things that there are no risks in.'

"'You have no guts when you take this drug.'

"A patient who, as a boy, had been several times arrested for fighting, said: 'I have not been arrested for fighting since I took the stuff. It makes a coward of you because you are ashamed of it and you are less aggressive.'

"Although the immediate effect of all opiates is to curb criminal tendencies, the continued effect of the drug is to create petty thieves because the lethargy, loss of ambition, idleness, and physical depletion produced by the drugs, together with the social and legal difficulties of an addict's career, results in moral deterioration and financial embarrassment. Many of the cases studied have been physically and morally depleted by their addiction and its attendant social handicaps. Addicts understand and speak of the demoralizing effect of addiction on them, and their records prove it to be true. It thus happens that the good resulting from the soothing effect of narcotics on vicious, aggressive criminals is more than counterbalanced by its deteriorating effects on less abnormal addicts.

"Although addiction was harmful to most of the neurotic and mildly psychopathic individuals among these cases, only a few who were regarded as having had in the beginning potentialities for growth into first-class citizens became thieves in order to satisfy their addiction. The more normal addicts continued to work and support themselves honestly. When this became impossible, they as a rule sought cure in order to relieve the financial burden.

CRIMINAL RECORDS

"In this series of 181 cases, 98 had been arrested one or more times during their lives for offenses ranging in degree from fighting and drunkenness to attempted murder, 59 of them for violations of narcotic laws. The only arrest in 31 cases was for violating these laws, while 39 were arrested for other offenses alone and 28 for both narcotic-law violations and other offenses. The total number of arrests was 284, counting only one arrest for each of two habitual criminals about whom definite information was not available.

"Some of the arrests were for offenses committed before addiction occurred, and most of them, excluding the narcotic-law violations, were for offenses such as fighting, drinking, soliciting, and fornication. All of the arrests for drinking and most of those for fighting were of drunkards before they became addicted or during short periods after they had been cured of addiction and before they resumed the taking of drugs. Of the total number of arrests, 81 were for violations of the narcotic laws; 40 for drinking; 25 for fighting and disorderly conduct; and 50 others unclassified occurred in three habitual offenders. Most of these were for disorderly conduct, chiefly drinking and fighting. The remaining arrests were chiefly for stealing, soliciting, adultery, bootlegging, or on suspicion. Only a few were for more serious offenses, and these were committed by extreme psychopaths who would have been criminals in any event.

"Only 4 of 30 Negroes had escaped arrest. Nineteen of them had violated the narcotic laws. There were 78 arrests of Negroes, 12 of which were for soliciting and 25 for narcotic-law violations. There were 7 pure-cocaine addicts among them who were arrested 29 times, and 47 of the total number of arrests were accounted for by 6 psychopathic Negroes.

"An examination of the data in connection with the type of individuals arrested showed that those who had been normal or who had approached normality before becoming addicted had escaped arrest as a rule, except for violations of the narcotic laws. The most significant finding is the absence of arrest for fighting and drinking in those who were addicted to opiates at the time of arrest.

"The habitual offenders in this series were no doubt either actual or potential offenders before they became addicted."

Relative to the increase of addiction to narcotics among prisoners, the author says that it is chiefly due to the passage and enforcement during the last ten years of anti-narcotic laws both state and federal. To a lesser degree he attributes it to some increase of addicts convicted of stealing—the result of the high cost of illicit drug.

In support of his claims that heroin has not caused an increase in crimes of violence in this country, he quotes the New York and Chicago homicide rates for certain years. In New York heroin is the drug of choice, while in Chicago morphin is chiefly used.

He continues as follows:

"Reports of narcotic agents[69] for the year ending June 30, 1922, show that in four states—New York, New Jersey, Pennsylvania, and Delaware—heroin was the opiate of addiction, while in other sections of the country it was morphine, and heroin was rarely used. This is still true of the West and South, but the use of heroin by addicts is spreading along the eastern seaboard as far south as Washington. In Washington the dissipated addicts now use heroin, and the latest report shows that they have been rapidly turning to heroin in Baltimore because of the scarcity of morphine. While morphine was the sole opiate of addiction in Baltimore, the homicide rate increased from 6.4 per 100,000 during the period 1912-16 to 8.6 during the period 1917-21, but since heroin has gained a hold, it decreased from 10.2 in 1922 to 7.2 in 1923. The rate has, however, increased somewhat in two heroin cities, Philadelphia and Washington, but not to the same extent as in a number of morphine cities, and the rate in Philadelphia and Washington is much lower than in some large cities where heroin is seldom used by addicts. It is thus seen that heroin is the drug of addiction in only one section of the country, and it happens that this section has a comparatively small homicide rate. In twenty-eight representative cities, the homicide rate increased from 8.3 per 100,000 for the period 1912-16 to 9.6 per 100,000 for the period 1922-23. It is interesting to note that the general increase in the homicide rate has occurred in the face of a decrease in one large center of population, New York City, and in this center, also the center of heroin addiction, the rate is only 57.3 per cent of the general rate.

"If one examines the situation as to crime from the standpoint of drug addiction alone, the conclusion would be that the introduction of heroin had retarded a general increase in the homicide rate, but we do not believe that any student of crime would accept this conclusion. The inference to be drawn from the psychological analysis of addicts, from the trend of addiction, and from the statistics on crime, is that neither the introduction of heroin, the marked decrease of addiction, nor the disconcerting influence of narcotic laws on addicts has had any measurable effect in increasing or reducing the incidence of violent crime, but that the criminal psychopath will commit murder regardless of whether or not he happens to be an addict. Fluctuations in the homicide wave and differences in rates in various parts of the country are due to factors that bear no relation to drug addiction. A discussion of these factors is out of place here.

SUMMARY AND CONCLUSIONS

"All preparations of opium capable of producing addiction inhibit aggressive impulses and make psychopaths less likely to commit crimes of violence.

---

[69] From files of Narcotic Division, Bureau of Internal Revenue.

"The inflation of personality produced by large doses of morphine or heroin is a state of ease, comfort, and freedom from pathological tensions and strivings brought about by the soothing narcotic properties of opiates on abnormal persons.

"Nervously normal addicts are not inflated, and psychopathic criminals are less dangerous when inflated than when in their normal condition.

"The inflating properties of heroin are similar to those of morphine.

"The heroin hero is a myth.

"Both heroin and morphine in large doses change drunken, fighting psychopaths into sober, cowardly, non-aggressive idlers.

"Cocaine up to a certain point makes criminals more efficient as criminals. Beyond this point it brings on the state of fear or paranoia, during which the addict might murder a supposed pursuer.

"Habitual criminals are psychopaths, and psychopaths are abnormal individuals who, because of their abnormality, are especially liable to become addicts. Addiction is only an incident in their delinquent careers, and the crimes they commit are not precipitated by the drugs they take.

"The increased addict prison population is due to the rigid enforcement of laws enacted within the last ten years and designed to curb the drug evil by making the possession or handling of narcotics by unauthorized persons a prison offense.

"Heroin owes its reputation as a crime producer to the accident of having been introduced to the underworld addicts in the largest city of the country shortly before the new narcotic laws forced these addicts on public attention. Heroin is the drug of addiction in only one section of the country along the eastern seaboard.

"In New York City, the center of heroin addiction, the homicide rate has decreased during the past twelve years in the face of an increase in the rate for the country as a whole, and the rate for twenty-eight representative cities is nearly double that of New York."

In another paper published in the same year, after noting the paucity of figures dealing with the intelligence ratings of narcotic addicts, the author records his own observations and conclusions as follows:

"In order to throw further light on the subject, 100 cases were tested by me during the course of a more general psychiatric and personality study of addicts. As far as the convenience of the study would allow, the cases given intelligence tests were selected as they came to my attention, but various factors prevented the testing of every case studied so that by the time 100 cases had been tested a total of 150 had been examined. The results do not, therefore, represent a true cross-section of the intelligence of addicts in my series of cases. When lack of time was a factor in the examination of several cases so that not all could be given intelligence tests, those who obviously had a high grade of intelligence were not tested. This procedure resulted in the exclusion from the group of one mechanical engineer, three lawyers, one former magazine proprietor, one writer for a newspaper and two physicians. Also, of 20 professional men who were examined at their homes, only two were given intelligence tests. However, these cases, because of their intelligence, were visited particularly for the purpose of studying the general characteristics of high-grade addicts. They were, therefore, selected cases, and the inclusion of all of them in a group of 100 would have given to the group a higher intelligence rating than could be expected of the average run of addicts.

"At the time of their examination, 17 of the 100 cases tested were in prison; 17 were being given prescriptions for opiates free of charge by a city physician; 63 were receiving treatment in public hospitals and 3 were at their homes. It is believed that these cases represent a fair average of addicts as they occur in the country as a whole, but the factor of selection above referred to is thought to have brought together a group with a general average of intelligence slightly lower than the examination of all addicts would show.

"Using the Stanford-Binet tests and avoiding the period of withdrawal symptoms, so that the performance of any patient would not be affected by them, results as follows were obtained.

	White	Colored	Total
Intelligent quotient below 70	2	8	10
Intelligence quotient between 70-75	8	2	10
Intelligence quotient between 76-85	9	5	14
Intelligence quotient between 86-95	32	6	38
Intelligence quotient between 96-105	17	3	20
Intelligence quotient between 106-110	6	1	7
Intelligence quotient above 110	1	0	1

"In interpreting these findings it is necessary to consider the tests upon which they are based. Terman devised the Stanford revision of the Binet tests, so that in using it on any large number of unselected cases a certain proportion would show normal intelligence and as many would test above this normal group as below it. The tests were selected by him from results obtained in the examination of 1000 children, but he indicates that they give the same relative results when applied to adults.

"The scale of intelligence for these cases differs from Terman's in that a higher percentage of cases is found in its lower levels and only one in the upper levels designated by him as 'superior' or 'very superior.' The exclusion of certain professional men from the group tested accounts in part for this difference, but it does not explain all of it. There were in the group 25 colored cases most of whom tested low and this circumstance swelled the number in the lower levels.

"Terman classes as feebleminded all who have an intelligence quotient below 70. In this series 10 per cent of the entire number tested below 70, but only 2.6 per cent of the whites registered so low. Again, Terman says that among those with intelligence quotients above 75, feeblemindedness is rare. Of the 100 addicts, 80 per cent of the total and 86.6 per cent of the whites tested above 75 as against 97.7 per cent of the unselected children examined by

Terman. According to Terman's scale it would be necessary to class at least 20 per cent of the entire number, and 14.5 per cent of the whites, as probably feebleminded because these proportions tested below 75; also, according to his scale, 10 per cent of the entire number, and 2.6 per cent of the whites would be classed as surely feebleminded because these proportions tested below 70.

"While it is believed that Terman's scale is fair for American school children, it is not thought that comparable results can be secured by applying these tests, or any others, indiscriminately to adults. This has been pointed out by Wallin and other workers in this field, and it has been clearly demonstrated in the examination of thousands of immigrants. Mental tests are undoubtedly valuable, but it is now generally accepted that a rigid mathematical interpretation of them cannot be substituted for the social criteria in the diagnosis of feeblemindedness in adults. The case of the jockey cited below is illustrative of other cases in the series of 100 who tested below 75, but who, nevertheless, are clearly not feebleminded.

"A former jockey with an intelligence quotient of 73 is now making $200 per month as a horse trainer and living happily with his wife. No one would suspect this case of feeblemindedness, but the fact that he had been arrested twice for drinking and once for dangerous assault before becoming an addict, and had been barred as a jockey for dishonest riding, indicates some unusual traits of personality characteristic of the class from which many addicts are recruited. Had this case been sent to school regularly instead of to the track when a boy of nine years, his intelligence quotient as shown by the test would have been much higher.

"The diagnosis of feeblemindedness depends on the criteria used and on individual judgment in applying the criteria. It naturally follows that there must be a difference of opinion about certain cases, and others would consider a larger or smaller number of these cases feebleminded than I have diagnosed as such. One addict, socially acceptable in that he had made a living and managed his affairs with ordinary prudence, was considered feebleminded because in spite of fair educational opportunities, his intelligence quotient was below 65 and his general mental reactions were very slow. Other cases not socially competent but with intelligence quotients around 75 were not considered feebleminded because their difficulties were obviously due to psychopathic traits rather than to intellectual defect.

"Using the social criterion along with the results obtained by mental tests, it was concluded that 5 of the 100 cases were feebleminded and 3 of these were near the border line. This gives a percentage of feeblemindedness higher than that supposed to exist in the population as a whole, but it does not necessarily indicate that feeblemindedness is an important predisposing cause of drug addiction.

"Ninety per cent of the 100 cases were either psychopathic or were suffering with some form of neurosis before they became addicted. Bailey and Haber have shown that the incidence of neuroses among mentally defective soldiers was four or five times as great as among average soldiers. This is an observation that probably has general application, and if so it means that among nervously unstable individuals there is a higher proportion of feeblemindedness than among average individuals. The higher proportion of mental subnormality among the addicts tested as compared with the population as a whole may then be explained by the fact that most of them were afflicted with other nervous conditions.

"It is reasonable to suppose that the high degree of suggestibility of the feebleminded as compared with persons of normal intelligence would make them more susceptible to drug addiction, but, judging from these 100 cases, feeblemindedness or mental dullness is apparently not of itself an important predisposing cause of drug addiction. In fact, some of the worst of them—from the standpoint of trifling reasons given for their original addiction and for relapse after cure—had intelligence quotients around 100. If increased suggestibility of the mentally subnormal in this series of cases was at all operative in bringing about their addiction, it was surely overshadowed, as an etiological factor, by the other nervous symptoms and deviations of personality with which most of the cases suffered. In another paper it will be shown that these abnormal nervous conditions are of primary importance in the etiology of drug addiction, and this finding, considered together with the results obtained by the intelligence and social tests, seems to indicate that the relation of mental subnormality to drug addiction is in direct proportion to its relation to other nervous abnormalities."

Résumé

In the foregoing, one is struck with the contradictions apparent in the widely varying views expressed as to the types of individuals predominating among chronic opium users. Unless we bear in mind, along with other co-existing factors which will be discussed below, the fact that for the most part each writer was influenced by impressions received from observations on selected cases, we may become confused by the picture presented. For example, terms such as "constitutionally inferior," "degenerate," "vicious," "highly intellectual, akin to genius," "of the upper social strata," "of the most depraved type," "potential criminals," etc , etc., commonly have been used to indicate type characteristics. All too often the proponent for one type or another loses sight of the fact that his experience has been limited because of certain influencing factors to a selected group. It is obvious, therefore, that generalizations from such selected and hence quite atypical groups are valueless and prejudicial to a true conception of the real nature of the problem as a whole.

It is not unnatural, for instance, for the head of a penal institution in which cases of chronic opium intoxication are treated to come to the conclusion that the underworld and criminal classes are especially prone to this condition; for the head of a state hospital to conclude that the mentally unstable form a considerable majority of these patients, and for the proprietor of a private institution, where the cost of treatment is within the means of only a favored few, to claim that financiers, individuals highly successful in the business world, and professional groups able to pay the highest prices to a large extent are susceptible to opiumism.

Such a picture of individual contradictions, however, seems to serve a valuable purpose in indicating that the limited experience of each author has contributed a part of the truth and that the combined experience of all perhaps conveys a correct impression.

Another factor influencing their conclusions, which may not have impressed many writers, is that comprised in the chronic use of other drugs along with opium. It is known that the degenerative effects of cocain, for instance, are very marked and that the mental effect of this drug is quite different from that of opium. This is also true of alcohol, chloral, and certain other products, the use of which not infrequently, for one reason or another, is combined with that of opium or its derivatives. These multiple intoxications present a very different picture both clinically and psychologically. However, as opium is the drug under consideration and the one around which centres the greatest interest, it is not unlikely that the effect of the others frequently is disregarded and that the whole picture presented by the patient is attributed to opium alone. Further, it must be borne in mind that often users begin with one of the other drugs and later for one reason or another—possibly because of a mistaken idea as to its value in helping to eradicate the existing condition—take up the use of opium. The converse also is true, namely, that the opium user not infrequently adds the use of cocain.

In addition to the foregoing possible misinterpretations on the part of the writers quoted, is it not possible that where individual writers have accorded to certain types a tendency to the use of this drug, effect has been mistaken for cause? Have not these patients, possibly as a result of the situation in which they find themselves—the toxic effect of the drug, disturbed metabolism, fear of discovery and realization that unaided they cannot regain their health—presented temporarily characteristics that were not constitutional with them? In spite of frequently repeated statements that the use of opium and its derivatives causes mental and ethical degeneration in all cases, we are inclined to believe that this alleged effect has not been established. The evidence submitted in support of such statements, in practically every instance coming under our notice, has been secured *after* the development of the addiction and was not based on a knowledge of the individual's condition *prior* to his addiction. In other words, the pre-addict has not been studied, and traits of character, ethical standards, and intellectual capacities based on *post hoc* findings may or may not have a *propter hoc* significance and effects attributable to the influence of the drug quite possibly may be evidence—as also may the taking of the drug—of pre-existing constitutional tendencies. It may be said with equal truth in considering the claims of those who state that certain types of individuals comprise the bulk of chronic opium users, that for one reason or another in the writings of many, "types" as generally understood are not considered as such until extraneous circumstances, possibly even the use of the drug itself, have altered the individual or group in question. In other words, what might be called the original type has come to be something else or attributes or factors not inherent in type delineation have been introduced as type-descriptive. Wherever the truth may lie the evidence submitted in support of the statements appearing in this chapter dealing with type predisposition and with the effect of opium use on mental and ethical characteristics is, in our opinion, insufficient to warrant the opinions expressed.

The publication and wide-reporting of conclusions of this nature based upon insufficient data have led to the general acceptance of biassed views. Misconceptions would not arise if the same audiences were reached by all such announcements, as they would undoubtedly counteract each other's prejudicial influence and something more nearly approaching the truth than the statement of any one observer would remain in the reader's mind.

For the most part, unfortunately, the public's interest is arrested and its attention focused upon the article, talk or treatise that first comes to its notice and, on the assumption that this first article is the whole truth, a temporary but often very active and possibly pernicious enthusiasm is aroused. This results frequently in the hasty and ill-considered action of considerable groups. Thus through the usual channels of news dissemination a point of view, which at best represents but a portion of the truth, is given wide publicity and receives credence quite out of proportion to its significance.

Unfortunately, in an attempt to present a comprehensive picture of the sociologic, constitutional, and other types of individuals involved in chronic opium intoxication, we are handicapped by the fact that there are available few valuable data, but rather in their place we find categoric statements without any presentation of the evidence upon which they are based. For the most part, we have found as data brief series of cases which by reason of the factors determining their selection may not be considered typical of the opium using population as a whole.

In general, however, it would appear from the data submitted that this condition is not restricted to any social, economic, mental, or other group; that there is no type which may be called the habitual user of opium, but that all types are actually or potentially users.

CHAPTER IX

TREATMENT

The first efforts at group control of chronic opium intoxication grew out of those directed at the relief of the individual. That the first experiments along this line were made by the patient alone or assisted by family or friends is told in many of the early chronicles and it was these doubtless that served to awaken the first conception of a situation hitherto unsuspected. Here and there, as the problem grew in Europe and America, physicians began to appreciate its importance, to realize that these cases needed their assistance, and to seek to discover a "cure" or method of treatment that could be applied successfully and leave the patient in a satisfactory physical and mental state.

As we have seen in earlier chapters, at first the terms "appetite," "habit," and "craving" alone were employed to designate this condition but later, theories involving definite pathologic changes were advanced. These fundamental differences as to the nature of the condition and many variations and combinations thereof naturally led to widely differing methods of treatment and widely varying attitudes toward the individual patient.

When professional and public appreciation first began to be aroused, medicine was in its empiric stage—indeed the development of the problem itself is proof of this—and it is quite natural that as in other conditions remedial measures were directed at symptoms. It is not surprising therefore that with such conflicting fundamental theories and the status of medical knowledge of the period there developed to meet the growing need a multitude of "cures" and routine systems that became the vogue and found many or few adherents in proportion to their actual or fancied efficacy or to the persistence and enthusiasm with which their originators or proponents advocated their adoption.

In order to avoid repetition, as far as it is practicable we have selected the principal types of treatment as commonly practised today together with descriptions of such of the earlier efforts as may give an idea of their development. For reasons already suggested no special arrangement except that of chronology has been attempted. The different schools of thought are all represented and if the lines of cleavage are less distinct in this chapter than in some others the significance of the fact is a matter for the reader's interpretation.

George B. Wood—1856.[1]

"It is satisfactory to know that this evil habit may be corrected, without great difficulty, if the patient is in earnest; and, as the disorders induced by it are mainly functional, that a good degree of health may be restored. It will not answer to break off suddenly. No fortitude is sufficient to support the consequent misery, and life might be sacrificed in the effort. Of the particular phenomena which might result I have no experience; for I have met with no case in which the attempt has been made, or at any rate more than momentarily persevered in. Dr. B. H. Coates, however, states that he has seen well characterized cases in which delirium tremens occurred (N. Am. Med. and Surg. Journ.[2] iv. 34); and this result might reasonably be anticipated. The proper method of correcting the evil is by gradually withdrawing the cause; a diminution of the dose being made every day, so small as to be quite imperceptible in its effects. Supposing, for example, that a fluid ounce of laudanum is taken daily, the abstraction of a minim every day would lead to a cure in somewhat more than a year; and the process might be much more rapid than this. Time, however, must be allowed for the system gradually to regain the healthy mode of action, which it had gradually lost."

According to Erlenmeyer,[3] the first person to describe the abrupt withdrawal method was Dr. Eder of Vienna in 1864.[4]

Alonzo Calkins—1871.[5]

"The *specific Rationes medendi* or methods of treatment, are in the main two: the Perturbative mode as it may be appropriately designated, which consists in withholding the narcotic peremptorily and absolutely; and the *Gradative* or *Reductionary* plan, that which proceeds by regular fractional diminutions. A third and subordinate division is the method by Compensation and Substitution. The cardinal modes are subject to their individual adaptation to considerable modifications.

"*The Perturbative Method.* Though intemperate persons of whatever description, as Dr. Day remarks, view the sudden withdrawal of their accustomed stimulus with apprehension for consequences, nevertheless a partial suspension is found in the actual trial less endurable than deprivation in the totality. Just as the pendulum oscillates backwards and forwards along its arc times over before it settles quietly at the intermediate point, so in familiar experience it is commonly found easier to swing from one extreme to the opposite rather than to halt halfway. The hungry man, food out of sight, may prolong his fast for days together; a single morsel alone got hold of serves not as refreshment but only as a tantalizer.

---

[1] Wood, G. B.—A Treatise on Therapeutics and Pharmacology or Materia Medica. 1856.

[2] This article was published in 1827.

[3] Erlenmeyer, A.—Considérations sur la Morphinomanie et son Traitment—Encéphale. 1886. Vol. 6. p. 677.

[4] We have been unable to verify this reference.

[5] Calkins, A.—Opium and the Opium Appetite—1871.

"To this plan appertains one particular advantage, that so long as nothing remains there is nothing for abnormal desire to whet itself upon. The observation in regard to all narcotic stimuli is in one respect uniform and invariable, namely this, that the dormant appetite is rekindled as readily and as fiercely no more by a full dose than by an inconsiderable fraction of one. 'Ex una scintilla incendia'—a spark may initiate the conflagration.

"To Dr. Macgowan, Missionary on the Ningpo station twenty years since, appears to attach the credit of priority in the inauguration of this practice. In a letter to the writer he thus speaks: 'Instead of pursuing the course favored here in China by other foreigners my collaborators (the plan of gradual reduction concurrently with the substitution of other toxics in their place), the course followed out at my hospital has been to cut off the opium entirely and at once, with this single modification in instances of allowing a little of the comp. ipecac powder to meet the colliquative diarrhoea so often ensuing. So severe was this ordeal to such as undertook it that only the more resolute of the patients would submit and persevere, but such were sure of coming out of their emaciation and debility, rejuvenated and renovated as if fresh from a dip in the cauldron of some Media.' "

* * * * *

"A writer in the *British Medical Journal* of 1867 expresses his views, based upon a considerably varied observation both at home and in the Far East, in the following language: 'Absolute and immediate suspension is for efficacy the far more reliable plan, being less tedious, less exhausting, less the occasion of hard suffering.' Agreeably to his proposition the customary quantity should be cut down at once by one-third, to be followed by rapid reductions on the remaining two-thirds."

* * * * *

"The successes achieved upon this the heroic method at the institutions (the course held in especial favor there) have been very satisfactory."

* * * * *

"The Reductionary course, less favored in the asylums as being less active and prompt, has in private practice operated very successfully upon a considerable number of untoward cases. To work feasibly the process must be a *quale-ab-incepto* progress, proceeding by substitutions in regular gradation throughout. The main objection urged against this practice is the fact, that the patient is liable to tire of a course conducted thus slowly and protractedly. Among those particularly partial to this mode is Dr. Bernir of the Haymarket, London, who expresses his approbation from a large observation made in China."

Horace Day—1872.[6]

"The opium-eater will not regard as amiss some few suggestions as to the mode in which his habit may most easily be abandoned."

* * * * *

"The object I have in view is not, however, so much to make suggestions to medical men as it is to awaken in the victims of opium the feeling that they can master the tyrant by such acts of resolution, patience, and self-control as most men are fully capable of exhibiting. Certain conditions, however, seem to be the almost indispensable preliminaries to success in relinquishing opium by those who have been *long* habituated to its use. The first and most important of these is a firm conviction on the part of the patient that the task can be accomplished. Without this he can do nothing. The narratives given in this volume show its entire practicability. In addition to this, it should be remembered that these experiments were most of them made in the absence of any sufficient guidance, from the experience of others, as to the method and alleviations with which the task can be accomplished. A second condition necessary to success, is sufficient physical health, with sufficient firmness of character to undergo, as a matter of course, the inevitable suffering of the body, and to resist the equally inevitable temptation to the mind to give up the strife under some paroxysm of impatience, or in some moment of dark despondency. With a very moderate share of vigor of constitution, and with a will, capable under other circumstances of strenuous and sustained exertion, there is no occasion to anticipate a failure here. Even in cases of impaired health, and with a diminished capacity for resolute endeavor, success is, I believe, attainable, provided sufficient time be taken for the trial."

* * * * *

"This effort should be made with the advice and under the eye of an intelligent physician. So far as I have had opportunity to know, the profession generally is not well informed on the subject. In my own case I certainly found no one who seemed familiar with the phenomena pertaining to the relinquishment of opium, or whose suggestions indicated more than vague, empirical ideas on the subject. But even in cases where the physician has had no experience whatever in this class of disorders, he can, if a well-educated man, bring his medical knowledge and medical reasoning to bear upon the various states, both of body and mind, which the varying sufferings of the patient may make known to him. Were there, indeed no professional helps to be secured by such consultation, it is still of infinite service to the patient to know some one to whom he can frequently impart the history of his struggle and the progress he is making. Such confidence may do much to encourage the patient, and no one is so proper a person in whom to repose this confidence as an intelligent physician.

"The amount of time which should be devoted to the experiment must depend very greatly upon these considerations—the constitution of the patient, the length of time which has elapsed since the habit was formed, and the quantity habitually taken. When the habit is of recent date, and the daily dose has not been large—say not more than ten or twelve grains—if the patient has average health, his emancipation from the evil may be attained in a comparatively short period, though not without many sharp pangs and many wakeful nights which call for the exercise of all his resolution.

---

[6] Day, H.—The Opium Habit. 1872.

"The question will naturally suggest itself to others, as it has often done to myself, whether a less sudden relinquishment of opium would not be preferable as being attended with less present and less subsequent suffering. Numerous cases have come under my notice where a very gradual reduction was attempted, but which resulted in failure. Only two exceptions are known to me: in one of these the patient, himself a physician effected his release by a graduated reduction extending through five months. The other is the case of Dr. S., a physician of eminence in Connecticut many years ago."

* * * * *

"The general directions I should be disposed to suggest for the observance of the confirmed opium-eater would be something as follows:

"1. To diminish the daily allowance as rapidly as possible to one-half. A fortnight's time should effect this without serious suffering, or anything more than slight irritation and some other inconveniences that will be found quite endurable to one who is in earnest in his purpose.

"2. For the first week, if the previous habit has been to take the daily dose in a single portion, or even in two portions, morning and night, it will be found advisable to divide the diminished quantity into four parts."

* * * * *

"In the third week a further gain of ten grains can the more easily be made by still further dividing the daily portion into an increased number of parts, say ten. The feeling of restlessness and irritability by this time will have become somewhat annoying, and the actual struggle will be seen to have commenced. It will doubtless require at this point some persistence of character to bear up against the increased impatience, both of body and spirit, which marks this stage of the descent. The feelings will endeavor to palm off upon the judgment a variety of reasons why, for a time, a larger quantity should be taken; but this is merely the effect of the diminished amount of the stimulant. Sleep will probably be found to be of short continuance as well as a good deal broken. Reading has ceased to interest, and a fidgety, fault-finding temper not unlikely has begun to exhibit itself."

* * * * *

"I have not ventured to say in how short a time confirmed habits of opium-eating may be abandoned. In my own case it was thirty-nine days, but with my present experience I should greatly prefer to extend the time to at least sixty days; and this chiefly with reference to the violent effects upon the constitution produced by the suddenness of the change of habit."

A. Stillé—1874.[7]

"It may not be without profit to mention that the most successful means which have been employed to cure the habit of opium-eating consist in the gradual diminution of the dose of opium without the patient's privacy and the equally gradual substitution for it of aromatic and stimulant tonics. Ginger, black pepper colombo and quassia may be employed successively for this purpose.[8] If this plan cannot be carried out, it is far better, for the sake of the patient to insist upon an abrupt cessation of his habit than to attempt to win him from it by degrees. . . . If he passes safely through the terrible trial of total abstinence, his cure may be counted upon as probable. But he must meanwhile be not only encouraged morally, but physically sustained. Dr. Alexander Fleming[9] prescribes 40 minims of dilute phosphoric acid, and 80 minims of tincture of lupulin (d) an hour before meals in a wineglassful of water.

"At bedtime there is given, to promote sleep, tincture of cannabis, 30 or 40 minims and of Hoffman's anodyne a fluidrachm, appropriately diluted. The food should at first consist of milk and beef-tea, for which, as the appetite improves, more solid aliment may be substituted. Alcoholic stimulants should, if possible be avoided. Zinc, quinia, and iron, under various forms, must afford strength to the nervous system and a due body to the blood and both must be improved by stimulating the skin by means of baths, friction, active exercise, and whatever will tend to withdraw the patient from those habits of solitude and self-contemplation in which his vice has immured him."

E. Levinstein—1875.[10]

The earliest article published by Levinstein describing his method of treatment which we have been able to discover appeared in 1875.[10] However, he discusses his method in much greater detail in his book "Die Morphiumsucht" published in 1877 from Harrer's translation[11] of which we quote as follows:

"The chief principle in the treatment of morbid craving for morphia is the deprivation of the drug, the sudden process being preferable to the slow deprivation."

* * * * *

"As soon as the patient has consented to give up his personal liberty, and the treatment is about to commence, he is to be shown the rooms set apart for him for a period of eight to fourteen days, all opportunities for attempting suicide having been removed from them. Doors and windows must not move on hinges, but in pivots; must have neither handles, nor bolts or keys, being so constructed that the patients can neither open nor shut them. Hooks for looking glasses, for clothes and curtains must be removed. The bedroom, for the sake of control, is to have only the most necessary furniture; a bed, devoid of protruding bedposts, a couch, an open washstand, a table furnished with alcoholic stimulants (champagne, port wine, brandy), ice in small pieces, and a tea urn with the necessary implements. In the room which is to serve as a residence for the medical attendant for the first three days, the following drugs are to be kept under lock and key:—a solution of morphia of 2 per cent., chloroform, ether, ammonia, liq. ammon. anisat., mustard, an ice bag, and an electric induction apparatus. A bathroom may adjoin these two apartments. During the first four or five days of the abstinence, the patient must be constantly watched by two female nurses. Male attendants are of no use in cases of morbid craving for morphia, as they are generally more accessible to bribing, and are less to be relied upon and less capable of self-sacrifice. They are, however, wanted for the coarser manipulations, for attending to the bath of male patients, and may then be admitted under supervision."

---

[7] Stillé, A.—Therapeutics and Materia Medica. 1874.

[8] Mr. Little.—Month. Jour. of Med. Sci. June, 1850, p. 530.

[9] Brit. Med. Jour. Feb. 15, 1868.

[10] Levinstein, E. Die Morphiumsucht—Berl. Klin. Wchnschr. Nov. 29, 1875. Vol. 12. pp. 646-649.

[11] Levinstein, E.—Morbid craving for Morphia, translated from the German "Die Morphiumsucht" by Charles Harrer, M.D. 1878.

* * * * *

"During the first four or five days, the nurses must be changed every twelve hours, as the service requires mental and physical ability, and is very fatiguing."

* * * * *

"The first symptoms of the abstinence, showing themselves in weak persons after three or four hours, in strong people frequently as late as fifteen hours, after the last injection of morphia, such as uncomfortable feeling, languid pain in the limbs, yawning, sneezing, slight chill, are no objects for treatment; severe shivering necessitates going to bed, in order to become warm, which, on account of the depressed state of mind, is readily agreed to by the patients.

"Against the usually prevalent headache, cold water and ice compresses, either dropped on the forehead, or on the skull, may be recommended; against the severe griping pains in the epigastric region, compresses, moistened with chloroform, may be applied. Abdominal pains occurring seldom, but being very distressing, are relieved by mustard plasters and hot cataplasms; on account of their simplicity we use the Cataplasmes instantanes."

* * * * *

"Nausea and vomiting, as well as the dyspepsia, lasting for several days, are successfully treated by a solution of bicarbonate of soda, with tinct. nuc. vomic. and ol. menth. pip. Should the vomiting become more frequent at first ice pills, mustard plasters on the epigastrium or instead of the latter a local application of chloroform may be resorted to. In case, however, it should repeat itself twenty or thirty times in the twenty-four hours, thus threatening to exhaust the patient's strength, 1 to 3 tablespoonfuls of a solution of morphia (1 grain in 6 ounces) may be given.

"Should the patient refuse to take food on account of the continuous vomiting, and should severe symptoms of prostration set in, nourishing injections into the rectum must be administered.

"Diarrhoea, occurring regularly during the period of abstinence, is no object for treatment, as it mostly disappears of itself after a few days. Should it become of a severe character, however, or last longer than three or four days, warm water injections into the bowel (temp. 37 degrees C., 98.6 degrees F.) of 1 to 2 pints, repeated two or three times in the day, will prove of great benefit.

"The sleeplessness will resist any treatment during the first three or four days, and is the symptom mostly complained of by the patients. Prolonged warm bathing will not be endured by the patients at this time, giving as it does at the most half-hour to one hour's sleep. Hydrate of chloral, per os, or per anum, does not either at this period create sleep, its use often being followed by great excitement. After the lapse of the first four days however it will agree with many patients, exercising in such instances its hypnotic effects.

"The general debility and psychical depression of the first days will be successfully treated by warm baths, with cold douches of five minutes' duration. Do not allow yourself to be induced to abstain from giving them on account of any of the symptoms of abstinence, as all the patients suffering from the abuse of morphia, even if they have objected to the first bath, immediately begin to feel the comfort created by it, are refreshed afterwards, and impatiently long for a repetition. During the time of bathing, stimulants, such as champagne, port wine, beef tea, etc., may be given.

"The greatest care during treatment is to be bestowed upon the diet, from the commencement of the withdrawal of the drug. During the first three days, food is only to be given in a fluid form; strong wines and, according to individual susceptibility, pure alcoholic liquors are to be resorted to. They are best given in the same manner as a medicine, every hour or two hours.

"Many people have an intense craving for alcoholic beverages, others greatly objecting to them. The first-mentioned patients may be allowed to drink wine in unlimited quantities, without any ill effects, as by doing so they pass over the first days of abstinence in a less distressing manner; should, however, there be reluctance and distaste for alcohol a light milk diet (2 ounces of milk every hour, or two hours) may be ordered. This agrees well even with persons who are greatly troubled with vomiting."

* * * * *

"The simple collapse will disappear under the above-mentioned dietetic régime, the severest forms, however, requiring an energetic and very attentive treatment.

"It is advisable to guard against looking at every condition of exhaustion as collapse, and the same may be said of patients, especially females, possessing a great talent to simulate conditions resembling collapse; but it is true, nevertheless, that a mistake made under such conditions is not of very great importance and would only have the disadvantage of prolonging the period of the treatment.

"A medical man who does not lose his quiet composure when at the bedside, relying on the apparent facts and considering the intervening symptoms, will neither commit the above-mentioned mistake, nor be guilty of the irreparable fault of overlooking a severe collapse.

"The symptoms of collapse, requiring energetic action, are principally caused by the heart, less frequently by the brain, and only exceptionally by the lungs.

"If the character of the pulse is changing, i.e., the previously soft condition getting threadlike, sinking gradually or at once, after having become irregular, to one-third or a smaller fraction of its former normal frequency; if the patient's face is getting pale, the nose becoming pointed, and if the previous excitement suddenly is replaced by a quiet demeanor, or by fainting fits; if somnolence sets in accompanied by deep and slow respiration—an injection of ½ grain of morphia is to be administered at once as an indicatio vitalis. If within ten minutes the pulse and the general condition do not improve, the injection is to be repeated once or twice until the return of the normal condition is evident. At the same time the patient is to be kept awake by counter-irritation, smelling salts, cold compresses on the head, dropping ether on the skull, by talking loud to him and shaking him; and stimulants such as liq. ammon. anisat., champagne, port wine, brandy, hot coffee or tea with rum, are to be given internally.

"If on the dangerous symptoms subsiding, the patients fall asleep, the respiration and circulation must be watched.

"Should the severe collapse return on the same or following day, the latter only occurring in quite exceptional cases, the same treatment must be resorted to."

In the 1883 edition of "Die Morphiumsucht,"[12] Levinstein introduces a modified method of abrupt withdrawal in which small doses of the drug are employed for a time in the case of patients in a serious condition suffering from tabes, phthisis, emphysema, and heart trouble. The indication for its use is increased morphin dosage with symptoms of chronic intoxication in persons who still possess relatively good resistance.

J. B. Mattison—1876-1893.[13]

In an article written in 1893, Mattison claims credit as the originator of the rapid withdrawal method, stating that he introduced it in 1876. We have been unable to trace the original article in order to verify this position. A good description of his method is contained in the above-mentioned article as follows:

"The modern and humane treatment of the morphine disease—preeminently an American plan—is compassed mainly by three drugs—bromide of sodium, codeine and trional. These form a combination of unrivalled value if properly used, in proper cases and, with certain minor aids, make a method far in advance of any yet presented to accomplish two leading objects—minimum duration of treatment and maximum freedom from pain.

---

[12] Levinstein, E.—Die Morphiumsucht. 3rd Edition, 1883.

[13] Mattison, J. B.—The modern and Humane Treatment of the Morphine Disease—Med. Rec., 1893. Vol. XLIV. pp. 804-806.

"In 1876, the attention of the profession was invited by the writer, to a new application of the well known power of the bromides to subdue reflex nervous irritation, by commending the use of bromide of sodium in this disease, after a plan quite original, which consisted in giving it, in gradually increasing amount, often enough to secure the effect of a continuous dose, for six to ten days, during which time the habitual opiate was to be gradually, but entirely, withdrawn, the object being to secure, by this preliminary sedation, a maximum sedative influence from the bromide at the time of maximum nervous irritation from the opiate-ending."

* * * * *

"The preliminary sedation feature of this method consists in giving the bromide of sodium in initial doses of 30 grains, twice daily, at 10 A.M. to 10 P.M., and increasing this dose 10 grs. each day, i.e., 30, 40, 50, 60, etc., until a maximum of 100 grains, semi-daily, is reached on the eighth day. On the ninth and tenth days, this maximum 100 grain dose is given in the evening only.

"This giving of the bromide applies solely to typically eligible cases. With some it is clearly contra-indicated, with others, a minor degree of preliminary sedation will suffice; and with all patients this rule governs: *Each case is a law unto itself, and the length and amount of the bromide giving, and consequent rate of opiate decrease, is determined entirely by individual peculiarity, as shown both before and during treatment.* This must not be forgotten; brains must be mixed with the bromide. This is a point of prime importance, and failure to put it in practice will account for ill success."

* * * * *

"During this time of bromidal medication, no other treatment is called for, usually, save a tonic regimen, and such regulation of gastric, renal, and alvine functions as each case may seem to demand, in this respect being markedly and favorably in contrast with any method that does not include preliminary sedation, and which makes essential various anodynes, sedatives, stimulants, and hypnotics during the opiate decrease, if the patient's comfort be conserved."

* * * * *

"Having secured the desired sedation and reached the end of the morphine-taking whatever reflex symptoms present are met, mainly, by codeine. This is the second special factor in the modern treatment of morphinism. . . .

"Of this therapeutical triad, codeine is the most important, for it can be used with good in all cases, whereas some will present in which the bromide should not or need not be employed, nor is trional essential.

"Codeine may be given pure, or in either of three salts—phospate, muriate, or sulphate. . . . The dose should be one to three grains, by mouth or skin, every two to four hours, according to case or condition, and continued in gradually decreasing doses and increasing intervals till no longer required. The dose by stomach should be double that by skin. As a rule, codeine is not called for till after the entire morphine-quitting. If needed earlier, it should be given.

"Cases will present in which the bromide need not, or should not, be used. In these codeine, with, maybe, some hypnotic, a few nights, will serve every purpose.

"The credit of first commending codeine in morphinism belongs to an American physician—Lindenberger, of California—who, in 1885, claimed for it merit after a method of his own. Later, Schmidt, Fischer, and Rosenthal, abroad, asserted its value, and my own experience, large and enlarging, makes me regard it my most valued aid."

* * * * *

"The third factor in this modern method is trional. Of hypnotics this is the latest, and in treating narcotic habitués the greatest. There is no doubt of this, I have given it hundreds of times, and say whereof I know. It is better than sulphonal—its nearest rival, and which, till the advent of trional, led the list of hypnotics in this condition—having an effect more certain, pronounced, and prolonged. My usual dose is forty grains for males, and thirty for women, given dry on tongue at 7 P. M. in the evening, after the last morphine-giving. It is largely soluble in hot water, milk, soup, or tea, and thus taken, acts quite promptly. It is not only *the* soporific in these cases, but is markedly sedative, and so serves doubly for good. We use it exclusively during the first six or eight nights, decreasing it gradually to half the initial dose, and then if needed, resort to chloral, paraldehyde, or cannabis. Some cases do not require it. One of the most striking ever under my care, now making a good recovery, has done notably well without it, codeine phosphate having secured several hours' sleep each night. My opinion, steadily growing, of trional in the insomnia of morphine habitués, is that it is the most valuable soporific we now possess."

* * * * *

H. H. Kane—1880.[14]

"The treatment of the morphia habit is of three kinds: sudden deprivation, gradual deprivation and substitution. The former is the plan of Levinstein, who has treated many cases in this way and with excellent success, so far as accomplishing a cure is concerned. It is necessary, however, that the patient be fully under the physician's control, the best place being an asylum. This plan has two decided objections: if the patients have been using the drug for a long time or in large quantities, their sufferings are agonizing, and there is decided danger of serious and even fatal collapse."

Kane further expresses himself in favor of the method used by Mattison.

C. W. Earle—1880.[15]

Earle advocates rapid withdrawal reporting that he used fluid extract of coca in three or four cases in all of which it proved of great service although he believes that it is by no means a specific and has no power to disgust the patient with the desire for his favorite drug. He also calls attention to the danger of opium patients becoming addicted to the coca habit and cites one of his cases as an example concluding that "while we have in coca an agent which is of undoubted value, its indiscriminate use should be interdicted." [16]

---

[14] Kane, H. H.—The Hypodermic Injection of Morphia. 1880.

[15] Earle, C. W.—The Opium Habit. Chicago Med. Review. 1880. pp. 442-446; 493-498.

D. Jouet—1883.[17]

Jouet does not approve of the abrupt method for the majority of cases but believes that where there is no reason to expect severe symptoms it may well be used. He states also that it may be used in insane cases where withdrawal symptoms usually are not present. Jouet commends Burkart's method of substitution stating that after all injections are replaced it is easy to withdraw the opium with little danger and good results.

William Pepper—1886.[18]

". . . The treatment of the opium habit and kindred affections is a subject which derives its importance from the following facts: First, the gravity of the disease, as regards the functions both of the body and the mind; second, the enormous suffering and misfortune, alike, on the part of the patient himself and on the part of those interested in him, which these affections entail; third, the fact that they are not self-limited, and therefore cannot be treated with indifference or upon the expectant plan, but are, on the other hand, progressive and gradually destructive of all that makes life worth living, and at last of life itself; and finally, because they are capable at the hands of skillful and experienced physicians of a cure which in a considerable proportion of the cases may be permanent."

* * * * *

"a. Prophylaxis.—It is impossible to overrate the importance of a true conception of the duty of practitioners of medicine in regard to the prophylaxis of the opium habit and associated affections. In communities constituted as are those in which the physicians practise into whose hands this volume is likely to fall, a large—I may say an enormous—proportion of the cases of habitual vicious narcotism is due to the amiable weakness or thoughtlessness of medical men. A majority of the cases occur either in chronic painful affections attended or not by insomnia, or as a result of acute illness in which narcotics have been employed to relieve pain or induce sleep. The chronic affections constitute two classes: First, those manifestly incurable, as visceral and external cancer, certain cases of advanced phthisis, confirmed saccharine diabetes, and tabes dorsalis. In such cases the use of morphine in large and often-repeated doses, although attended with evils and likely to shorten life, amounts to a positive boon. It is neither practicable, nor would it be desirable, to interfere with it. To this class may be added those cases of grave valvular or degenerative diseases of the heart where the patient has become addicted to the habitual use of narcotics. Here, notwithstanding the evils resulting from these habits, among which the likelihood of shortening the period of life must unquestionably be counted, the dangers of the withdrawal of the drug are so great that it must be looked upon as neither desirable nor feasible. Attention must, at this point, be called to the fact that great caution is required in the management of pregnant women addicted to narcotics. Incautious attempts to withdraw the habitual drug are almost certain to be followed by speedy loss of the foetus; and it is to my mind questionable whether anything more than the most guarded reduction of the daily dose should be attempted while the pregnancy continues.

---

[16] This is the earliest warning against the use of coca in the treatment of chronic opium users that we have discovered.

[17] Jouet, D.—Étude sur le Morphinisme Chronique. 1883.

[18] Pepper, William—System of Practical Medicine. Chapter on the Opium Habit by James C. Wilson. 1886.

"The second class of chronic cases includes individuals suffering from diseases which are remediable or capable of decided or prolonged amelioration. Among these affections are painful diseases curable by surgical procedures, such as certain obstinate and intractable localized neuralgias, painful neuromas, irritable cicatrices, pelvic and abdominal tumors, and surgical affections of the joints and extremities. Here, either before or after radical surgical treatment, an effort to relieve the patient from the bondage of habitual narcotism should be made. For reasons that are obvious, measures having this end in view should be instituted by preference subsequently to surgical treatment. To this class also belong certain painful affections occupying the border-region between surgery and medicine. These are floating kidney, renal and hepatic abscess, calculus, pyelitis, cystitis, impacted gall-stones, and thoracic and abdominal aneurism. In these cases the possibility of a cure renders it in the highest degree desirable that the opium habit should be stopped. Whether this attempt should be made while the patient is under treatment for the original affection, or deferred until relief has been obtained, is a question to be decided by the circumstances of the particular case under consideration. Finally, we encounter a large group of chronic painful affections coming properly under the care of the physician in which the opium habit is frequently developed. This group includes curable neuralgias of superficial nerves, as the trigeminal, occipital, brachial, intercostal, crural, and sciatic, and visceral neuralgias, as the pain of angina, gastralgia, and enteralgia, and the pelvic and reflex neuralgias of women. Here also are to be mentioned the pains of neurasthenia, hypochondriasis, and hysteria. In this group of affections the original disease constitutes no obstacle to the attempt to break up the habit to which it has given rise."

* * * * *

"Finally, the danger of yielding to the temptation to allow a merely palliative treatment to assume too great importance in the management of painful affections must be sedulously shunned. Too often these precautions are neglected, and the patient, betrayed by a dangerous knowledge of the drug and the dose by which he may relieve not only physical pain, but also mental depression, and tempted by the facility with which the coveted narcotic may be obtained, falls an easy victim to habitual excesses. The lowered moral tone of convalescence from severe illness and of habitual invalidism increases these dangers. Yet more reprehensible than the neglect of many physicians in these matters is the folly of the few who do not hesitate to fully inform the patient in regard to the medicine given to relieve pain or induce sleep, and to place in his hands designedly the means of procuring them without restriction for an indefinite period of time. Almost criminal is the course of those who entrust to the patient himself or to those in attendance upon him the hypodermic syringe. No trouble or inconvenience on the part of the physician, no reasonable expense in procuring continuous medical attendance on the part of the patient for the sake of relief of pain, can ever offset, save in cases of the final stages of hopelessly incurable painful affections, the dangers which attend self-administered hypodermic injections."

* * * * *

"Finally the dissemination of a wholesome knowledge of the methods by which the opium habit and kindred affections are induced, of the serious character of these affections, and of the dangers attendant upon an ignorant and careless employment of narcotics, would constitute an important measure of prophylaxis. I am fully aware of the evils resulting from the publication of sensational writings relating to this subject. Notwithstanding these dangers, I am convinced that a reasonable and temperate presentation of the facts in the popular works upon hygiene used in schools and in the family would exercise a wholesome influence in restraining or curing the tendency to the practice of these vices."

* * * * *

"Where these habits have resulted in consequence of the medicinal abuse of narcotics in acute cases from which the patient has long recovered, a determined effort to break them up should at once be instituted."

The author describes the abrupt and gradual methods of withdrawal and appears to favor the latter.

A. Erlenmeyer—1886.[19]

Erlenmeyer is considered by some writers the outstanding proponent of the rapid withdrawal method. In his article of 1886, he states that Dr. Pichon who says that the method of treatment by abrupt withdrawal is German and that by gradual withdrawal is French, is incorrect, inasmuch as both are German in origin. In a previous article the author claims he showed that Dr. Samter, a German, wrote on the subject in April, 1864, and that it was not until ten years later, after German medical literature on the subject was well developed, that the first French work appeared by Chouppe (Gazette Médicale 1874-80) and two years later one by Calvet (Essai sur le Morphinisme, 1876). He further states that the abrupt method should not be called German as Levinstein is the only German who used it, while the other German physicians opposed it and employed the gradual withdrawal method.

---

[19] Erlenmeyer, A.—1886. loc. cit.

In his book published in 1883,[20] he gives the three methods of withdrawal as follows:

1. *Gradual.* Oldest. Unsatisfactory.
   Disadvantages
      (a) Exceedingly difficult to control patient so that he cannot obtain drug secretly. This method does not guarantee this prevention.
      (b) Prolongation of morbid phenomena. Does not agree that patient can better endure abstinence symptoms under slow than under sudden method.
      (c) Consumption of whole time available for the therapy. Emphasizes need for long recuperation.
2. *Abrupt.* Levinstein—first advocate.
   Advantages
      (a) Certainty of success.
      (b) Rapidity of cure.
   Disadvantages
      (a) Almost impossible to practice this method in every hospital.
      (b) Very expensive.
      (c) Danger to life of patient by sudden withdrawal.
3. *Rapid.* Erlenmeyer.

Erlenmeyer sums up the advantages of the rapid method of withdrawal as follows:

1. Certainty of success as the isolation of the patient precludes access to morphin.
2. Freedom from danger as collapse does not threaten the patient's life.
3. Short duration of abstinence symptoms.
4. A longer period for convalescence.

Erlenmeyer strongly opposes the treatment of these cases in insane asylums as advocated by some writers and states that they should be treated in hospitals for other diseases. He also attacks the employment of cocain in the treatment of morphinism and warns of its dangers.

In 1909,[21] he describes the three methods again, not commenting on gradual withdrawal, stating that abrupt withdrawal is obsolete and no longer used, and adding a description of three other methods; viz:

The Substitution Method—Substitution of similarly active drugs

---

[20] Erlenmeyer, A.—Die Morphiumsucht—1883—Chapter on treatment translated by E. P. Hurd—1889.

[21] Erlenmeyer, A.—Behandlung der chronischen Morphinismus und Cocainismus. In. Penzoldt und Stintzing. Vol. 1-1909.

(opium, cocain, bromides, codein) with reduction of morphin. Erlenmeyer states that the principle of this method is wrong as the patients become chronic users of these substitutes.

The Chemical Method—Developed by Hitzig—In discussing this method Erlenmeyer concludes that it has two disadvantages. 1. Very many people do not take kindly to having the stomach emptied and 2. The hypothesis of the anacidity of the stomach contents during the use of morphin and of the hyperacidity after withdrawal is apparently false.

Suggestion and Hypnosis—Erlenmeyer emphatically denies that this method can cure morphinism.

Erlenmeyer introduced his method of rapid withdrawal about 1883 when he wrote a book on the subject. Since that time his procedure has been practically the same with the exception of a modification which he described in 1893. This, however, has nothing to do with the duration of treatment but involves only the application of a modification of Hitzig's procedure to relieve the hyperacidic condition of the stomach at the end of the withdrawal treatment.

The following is a brief description of Erlenmeyer's method:

The morphin is withdrawn as quickly as possible, but not abruptly and without danger to the life of the patient. Withdrawal is distributed over a period of from 4-10 days and depends on the condition of the patient, the dosage and the number of previous treatments, but above all on the general resistance of the patient. Small doses of 0.3-0.5 may be withdrawn in from 4-6 days, larger ones of 1.0-1.5 in 8-10 days. There is no set procedure, each patient requiring individual treatment. In this treatment there occurs neither collapse nor a noticeable disturbance of circulation or respiration and no delirium. It is true, nevertheless, that with this treatment the withdrawal symptoms may reach a high degree of severity but the whole course runs only a few days.

It is important to determine in the beginning of treatment the dose that should be administered. Many morphinists do not know for one reason or another exactly how much morphin they are taking within a given period. Some take a very large dose just before treatment begins in order to have it hold over. This measured dose may be determined by experimentation over a couple of days.

The measures indicated by the psychopathologic state of the patient are also of great importance. Steps must be taken to prevent deception and return to the drug and to offset during a later period of the treatment through outside, mechanical means weak will and loss of self-control. The treatment must be carried on in such a way that supply from home is impossible. This is effected in a hospital by means, the selection and carrying-out of which may be left to medical judgment. The location of the patient, his nurses and attendants, his food, baths, etc., are the concern of individual medical care and attention.

Erlenmeyer administers the daily dose in three and sometimes four equal amounts at stated intervals in such a way that the evening dose comes between 10 and 11 o'clock to insure good sleep.

Whenever possible the patient is allowed to eat after each injection. "I cannot recommend too strongly abundant supply of food from the beginning," he states. The author advises against alcohol in any form.

Further than this withdrawal may not be carried out according to rule, everything depending on the condition of the patient and the resulting symptoms. These often develop in rapid succession and therapeutic measures must be applied accordingly. It does not matter if once or twice the dosage is not decreased, thus causing a halt in reduction. In fact sometimes the condition of the patient requires a slight increase. In such necessary variations, one should not be confined too much to single symptoms, but should keep his finger on the pulse, watch for "cold blood" and never forget the needs of the whole situation. The importance of medical personality should not be underestimated. The psychopathic symptoms of restlessness and impatience often vanish on the appearance of the physician. The aggravation here as in traumatic neurasthenia is *signum morbi.*

Erlenmeyer so modified Hitzig's procedure that he could neutralize *in loco* the hyperacidity of the stomach contents at the conclusion of the withdrawal without the necessity of emptying the stomach. He accomplished this by giving 1 to 2 litres of Fachinger water daily. Through this procedure not only the gastric but also the withdrawal symptoms disappear. Erlenmeyer has used this method with success for fifteen years. Nevertheless one must regulate the procedure by an intimate knowledge of the patient's condition. The determination of the point at which to begin the administration of the Fachinger water is by no means easy and the ordering of the water in relation to time, number and size of doses often calls for daily adjustment.

Note: Forty years later Erlenmeyer published another article dealing with the treatment of this condition, but inasmuch as so long a period elapsed, this article is presented in its normal chronologic place rather than here.

R. Burkart—1884.[22]

Burkart prefers gradual withdrawal in the treatment of chronic opium intoxication, introducing a modification of the usual method by gradually substituting opium administered by mouth for the morphin hypodermically administered. He states:

"Since 1872 I have treated the cases of morphinism intrusted to me exclusively by the gradual withdrawal method, being actuated in the selection and development of this method by the following motives:

"Morphinists should undergo the least possible suffering in the treatment of their chronic poisoning, and the mode of withdrawal should make it possible for the patient to abstain from the given alkaloid with the most moderate withdrawal symptoms *(Inanitionserscheinungen)*. The patients should not be deprived of their personal liberty during treatment, at least in so far as they may give up treatment on their own initiative any time, if they wish to go back to morphine again in spite of medical orders. No physical force, but only moral suasion should be used by the attending physician if success is to be attained. The patient promises to submit unreservedly to the orders of the physician during treatment especially as to the withdrawal of the drug, the assignment of a nurse or other suitable attendant and the administration of medicaments. Failure to follow medical orders implies withdrawal from treatment."

* * * * *

"To carry out successfully this method of treatment it is advisable to have the patient in a hospital where continuous medical supervision, a good nursing staff, bathing facilities, etc., are available. Here it is unnecessary to keep the morphinist in detached rooms for the sake of the other inmates as is required in abrupt withdrawal, because it rarely happens that the patients during gradual withdrawal disturb their neighbors by their restlessness and loud noise. Usually my method of treatment for chronic morphine poisoning averts the delirium and excitement which are usually the result of abrupt withdrawal. One can always through reasonable persuasion and personal influence bring the patient to endure the suffering which is occasionally severe and to see it through to the end.

"Gradual withdrawal as I practice it can be carried out also in any private house, since it is really only a question of expense for the patient to prepare and arrange just for himself all of those facilities such as medical aid, nursing attendants, baths, etc., which are necessary to relieve his suffering. In any event, there are unusual cases which make it desirable to undertake gradual withdrawal under such private conditions.

"It is apparent that under such arrangements for treatment the morphinist can comparatively easily deceive the physician and secretly secure for himself the poison in order to satisfy the painful desire for morphine, at least much more easily than he could in a hospital. However, under any condition care and attention on the part of the attendants and physicians are needed to avoid deception lest morphine is taken secretly by the patient."

---

[22] Burkart, R.—Ueber Wesen and Behandlung der chronischen Morphium. Vergiftung—1884.

* * * * *

"Nevertheless I have been able to bring about 71 per cent cures in the treatment of morphinists under these conditions. This number means that among my 'not cured' morphinists there were many patients who it is true sought treatment but were not quite ready to stand much suffering and who immediately decided again to give up the cure, as soon as any noteworthy discomfort of withdrawal appeared. That such patients passed under my medical direction was quite natural from the reputation acquired by my method of treatment. . . ."

* * * * *

"In general, even my method of treatment of chronic morphinism is not free of disagreeable and annoying secondary symptoms; sometimes the patients during withdrawal, as stated above, are for a day at a time in a very distressing and deplorable state.

"Usually the period which I have found necessary for withdrawal varies between 14 and 21 days, according to the size of the daily dose. In especially weak cases sometimes I require an even longer period, 4-7 weeks, and have observed the best results as to cure and condition of the patient.

"I require every patient to remain at least 6 days after complete withdrawal under treatment.

"Generally I observe the same injection periods used by the patient during his former use of the drug and inject the morphine solution to correspond with the 2-4-5 times in 24 hours. On the first day I use about the same amount as the patient last used and then decrease the daily dose by about 0.3—0.2—0.01—0.005 as daily I withdraw in the beginning of treatment larger amounts and later smaller amounts."

* * * * *

"In addition to the subcutaneous administration of morphine all of my patients receive 1-2-4 times daily by mouth 0.03—0.04—0.07—0.09 opium purum or corresponding amounts of tinctura opii simplex. Usually in cases where over 0.25 morphine per day has been used I begin the administration of the opium when withdrawal has proceeded to the point where 0.07—0.09 morph. mur. is being administered within 24 hours. When the daily dose of morphine has been smaller, naturally the administration of the opium may be begun later. But in general I am guided as far as dosage and administration of opium are concerned by the severity of the withdrawal symptoms and I do not hesitate to begin administering opium when the morphine dosage is still high (over 0.1 p. day). In any event even where only the slightest withdrawal symptoms are present, I give opium during the last third of the period."

* * * * *

"The psychical manifestations such as anxiety, restlessness, etc., which I previously observed in withdrawal treatment without the substitution of opium, are not nearly so prominent when opium is used, as in abrupt withdrawal. Also the symptoms of the motor nervous system such as tremors, ataxia, paralysis and finally the muscle twitching which is so annoying to the patient do not appear in my treatment or at least do not return so frequently and so intensively as in abrupt withdrawal or gradual withdrawal without the substitution of opium.

"The digestive organs suffer far less in the opium treatment than for example Levinstein describes in his patients and as I must admit in some of my cases who were withdrawn gradually without opium. Usually they rarely vomit. . . .

"The withdrawal of the opium continued after the last injection of morphine is usually not difficult."

The author has not found other drugs such as sodium bromide, potassium bromide, hyoscin, etc., of much use.

B. Ball and O. Jennings—1887-1909.[23] [24] [25]

These authors point out that the treatment of "morphinomania"[26] consists of:

1. Placing the patient in a hospital where he is constantly under medical supervision.
2. Suppressing more or less completely the use of morphin.
3. Relieving the heart action at the proper moment by spartein to which is added if necessary an injection of morphin. It should be remembered that collapse may end in death and the use of morphin will immediately avert it.

The authors recommend the use of nitroglycerin in light cases when rapid but not lasting support is sufficient.

This treatment, Ball and Jennings state, should carry the patient through the acute state of withdrawal.

Ball[27] also writing in 1887, states the following:

"Abrupt suppression, recommended by Levinstein, and practiced by a great number of other physicians, has in its favor one great advantage; it causes the patient to suffer for a much shorter time. Once the crisis over, once the frontier crossed, the patient no longer feels the peculiar distress of the morphine dipsomaniac; he no longer has the painful sense of depression and of downheartedness which makes him long for another injection. But, on the other hand, by sudden suppression, we run the risk of producing the serious results already described. The patient may be taken with delirium tremens; he may be attacked by acute mania; he may finally (and this is the most serious danger), fall into collapse, which as I have already observed, is sometimes followed by death.

---

[23] Ball, B. and O. Jennings—Considérations sur le Traitement de la Morphinomanie, Encephale—1887—VII. p. 295-301.

[24] Ball, B.—The Morphine Habit. 1887.

[25] Jennings, O.—The Morphia Habit. 1909.

[26] The authors open their article with the following: "For a long time there has been noted a distinction between 'morphinism' and 'morphinomania.' By morphinism we mean the sum total of phenomena resulting from chronic poisoning; by morphinomania we understand the vicious habit consisting of taking almost always increasing doses of a toxic stimulant regularly."

[27] Ball, B.—Loc. cit.

"It is therefore almost impossible to carry through a sudden suppression outside of an asylum or hospital. In fact, immediate sources of assistance are indispensable for the patient during this course of treatment. . . ."

* * * * *

"Gradual suppression is an easier mode of treatment to employ; it is even the only treatment possible to try in the patient's home, or outside of special establishments. First, all the necessary precautions must be taken, to be certain that the patient does not baffle the surveillance to which he is subjected; then is to be fixed the rate at which the daily quantum is to be reduced. . . .

"Adjuvants are clearly indicated during the period of suffering, when the patient is being gradually weaned from his usual stimulant.

"First, and above all, a tonic and nutritious diet is necessary, and at first the patient should rest in bed, leaving it to take a little exercise at a later period, when the first difficulties have been overcome. Then there are many ways of improving his nerve tone. I by no means disapprove of the use of alcohol in moderate doses; but care must be taken to keep the patient within the strictest bounds. . . ."

The author also recommends coffee, caffein, hydropathy, alkaline bromides, chloral, paraldehyde, for insomnia, belladonna, gelsemium sempervirens, extractum thebaicum, and codein to relieve withdrawal pains, valerian to relieve general nervous excitement and baths.

In his book, written in 1909, Jennings[28] fully discusses his method of treatment as follows:

"I am more than ever convinced that in the morphia habit, which is a psychosomatic affection, and in which the mental and physical troubles are interdependent, conditioned the one by the other, the success of therapeutic measures, properly so called, depends on the mentality of the patient, and reciprocally.

"It is quite true that the habit can be 'knocked out' in a relatively short time by hyoscine, atropine, duboisine, piturine and by many other alkaloids, also by synthetic morphine-, or coal-tar derivatives: but such treatments require restraint, and experience shows that the results so obtained are rarely definite. When the weaning has been effected, not by re-education and restoration of the will, but by compulsion instead of guidance, this excites during suppression a latent hostility, which remains as a subconscious fixed idea. The subliminal desire is sure to be revived at some moment of weakness, as a return of craving, and to become the cause of relapse in the future. As Dr. Guimbail has remarked, 'to will in the present, is a serious guarantee for the future. Those who treat morphia *habitués* should not only aim at the suppression of the morphia, but also at the suppression of the desire. To succeed we should in a way effect the education of the dormant will.' "

---

[28] Jennings, O.—Loc. cit.

* * * * *

"It must not, however, be supposed that in the morphia habit medicinal treatment is only secondary, for encouragement is obviously the best means of overcoming the doubt and anxiety which keep every patient in bondage, and no better encouragement can be afforded to a morphia patient than the relief, by proper treatment, of the misery and wretchedness otherwise experienced, and which are none the less real because they are to a great extent exaggerated by mentality. Suitable physiological treatment must then be the basis of management.

"The method I have advocated during the past twenty years consists of three great therapeutic measures, together with the gradual reduction of morphia, coincidentally with progressive lessening of the strength of the solution, and with the substitution, at a certain point, of rectal injections. Latterly I have supplemented these sometimes by dionine. When the confidence of the patient is complete, and he is able to eliminate from his mentality doubt and anxiety, these measures will be sufficient, otherwise different sedatives may be required.

"But drug treatment is not paramount, and with the exception of heart tonics, and of agents that neutralize acidity, together with the Turkish bath, which respond, as I have shown to three formal indications, drugs and especially hypnotics should be used as little as possible. Renunciation must be effected chiefly by restoration of will, and nothing can be worse than restraint or compulsory suppression."

* * * * *

"To return to remedial treatment, a great many sedatives or hypnotics may be used accessorily and exceptionally with benefit, but if the object in view is permanent cure, and not merely a 'knockout' suppression, they should be avoided as far as possible.

"Dionine has proved of late years more helpful than any drug of the kind that I have given, but one patient for whom I prescribed it, acquired an addiction, and this often happens when this medicine is given as a 'cure,' and the case is not treated under proper direction.

"Of hyoscine I wrote in 1890, when I first reported my experience of it, that it was sometimes useful, but that in other cases I had been entirely disappointed by it. This, after a much more extended trial, is still my opinion.

"The same holds good of atropine, which I find more useful when associated with pilocarpine, for which reason piturine would seem to be more indicated. Bromide I seldom find necessary, and although sometimes very helpful, more rarely it is distinctly detrimental to recovery."

* * * * *

"With reference to management, one of the most important matters is the mechanism of the morphia reduction.

"I. A progressively decreasing quantity of morphia should, for reasons given elsewhere, be given daily in a constant quantity of salt solution; that is, there should be a progressive weakening of solution as well as a reduction of dose. This alone is sometimes sufficient to effect a cure and explains the occasional successes obtained with quack remedies containing nothing but morphia, which may become endowed with a potency which is the measure at the same time of the credulity of the dupe who takes them, and of the cleverness of those who apply in this manner psychology to trade.

"II. If further help is required in this direction, which is not always the case, the hypodermics should be gradually replaced when the patient has decreased to 2 grains by rectal injections (not suppositories): these in their turn must be decreased more or less rapidly, until given up, according to circumstances.

"Concurrently with methodical progressive reduction on the lines indicated, and with whatever means of physiotherapy may be found necessary, I always use the three modes of treatment which constitute what I have termed my 'therapeutic triad.'"

* * * * *

"For many years I have been using heart tonics and bicarbonate of soda in morphinism, not as a 'cure' but as part of the treatment which remedies the physiological disturbances, caused by suppression, and which by alleviating two of the principal factors of craving, reduces the otherwise intolerable wretchedness of an ordinary weaning to a perfectly bearable minimum."

* * * * *

"Vichy water is not a cure for the morphia habit. As a method of treatment *per se* there is no doubt that it is, to say the least, an exaggeration, a hasty generalization, and in view of this exaggeration a mistake was excusable ten years ago. At the present, however, the testimony of specialists to its symptomatic value is unanimous and conclusive, and it is surprising to find that in his last edition Sir Clifford Allbutt still remains ignorant of the facts of the case, and still continues to deny the value of Vichy water."

* * * * *

"The morphia habit is a toxic neurasthenia, a disease of overstimulation, and outside the special indications for cardiac tonics, for a flagging heart deprived of its accustomed stimulation, nearly all of the other somatic symptoms may be looked upon as nervo-katabolic. They react upon one another as the *ensemble* of the somatic disturbances of function react upon psychism.

"The result of overstimulation is to produce metabolic perversion and to cause fatigue, and the fatigue of the nervous centres causes katabolic insufficiency, the formation of acids, which in their turn keep up a condition of nervous exhaustion by chemical changes of the cells. I first suggested this as a factor of morphia craving in 1887. Two years afterwards Dr. Hagi found excess of acid in morphinism, and it is now admitted that fatigue, whether physical or mental, gives rise to the formation of acids, and that stimulation consists of abnormal elicitation of energy, leaving afterwards, reactive depression, and (with morphia addicts) exhaustion. In ordinary healthy tiredness the acids (phosphoric, lactic, carbonic) are soon eliminated, but when fatigue becomes more or less permanent, as in the toxic-asthenia of morphinism, the nuclei of the neurones, which in their normal condition are alkaline, become acid, and this can be shown histologically. The same thing is true of the muscles of the organism generally. Whenever a tired organ is examined histo-chemically, the acid reaction will be found."

* * * * *

"My third great remedial measure—the Turkish bath—is discussed in another chapter, but before leaving the question of physiological treatment, a few words are necessary about the administration of purgatives.

"It has been said that morphia in the organism is changed by oxidation into what is called oxydimorphine, and that it is the presence of this substance in the blood, and not want of morphia, that is the cause of craving.

"On this hypothesis the physiological treatment should then comprise the promotion of 'eliminatory discharges' which constitutes a natural means of cure. This plan is adopted in sanatoriums where sudden suppression is carried out, and the violence of the treatment helps no doubt to 'knock out' the addiction.

"Personally I have no experience of any knockout methods, which are entirely inapplicable in voluntary renunciation, based necessarily on the prevention of obsession. Several of my patients had, however, been 'cured' previously in this way, which shows that 'brutal,' as its partisans call it, suppression does not always act as a preventive of relapse.

"Laxatives are sometimes required in the beginning of a normal gradual suppression, but as weaning progresses the bowels regulate themselves. Towards the end there may be some looseness, but this is trifling when intestinal irritability from over-acidity is prevented by bicarbonate or Vichy water. More copious diarrhoea is an indication of a slower reduction."

* * * * *

"For morphia patients who were in the first instance psychasthenics, ill-balanced, irrestrainable emotives or impulsives, and who may be properly called 'drug-fiends,' the case is, however, different. When moral influence and persuasion, by demonstration of the practicability of intentional and persevering effort,—when what Dr. Harrington Sainsbury calls the personal appeal—does not suffice, compulsion of some kind is indispensable. Those who will not submit to guidance must consent to restraint, and the question will then be, what form this should take. Two means of treatment are at our disposal; the special drug sanatorium—hypnotism and hypnotic suggestion."

Paul Sollier—1894.[29] [30]

The first article published by Sollier of which we have record appeared in 1894. The following quotation presents a *résumé* of the development of his method of treatment based on 357 cases treated from that time to 1910:

---

[29] Sollier, P.—La Démorphinisation et le Traitement rationnel de la Morphinomanie. Sem.—Méd. 1894. pp. 146-152.

[30] Sollier, P.—Méthode physiologique de démorphinisation rapide basée sur 357 cas de guérison (1890-1910). Jour. de Méd. de Paris. Dec. 28, 1910.

"The fundamental mistake in the treatment of morphinism, the one which has given rise to the most fantastic articles and to the most incredible ones, consists in considering morphinism as primarily a psychical malady and secondarily as an organic state. As a matter of fact it is exactly the opposite. Even in emotional addicts the organic condition is the prime consideration as far as treatment is concerned.

"The reactions of demorphinisation are there for the finding. Elsewhere I have compared what takes place with what occurs in an infectious disease. Besides, this contention based on clinical observation has been amply confirmed by hematologic studies of morphinists before, during and after withdrawal undertaken by Drs. Chartier and Morat, my assistants at the Sanatorium of Boulogne, which they published in a preliminary paper to the Société de Biologie (June 25, 1909).

"The changes in the leukocyte picture enabled them to write in conclusion: 'this leukocytic reaction which is observed in the same general character during detoxication of all cases and in a marked and definite manner, even in addicts to small doses (3-20 centigr.) shows what profound changes the whole organism undergoes during its detoxication. It well demonstrates that it is not simply a psychical breaking-up of a habit but that it implies a true crisis, consisting in a violent disturbance of the body, analogous to an acute infectious disease. Besides it is to be noted that this leukocytic reaction of morphinists during suppression is entirely comparable to that occurring in the greater part of acute infections; polynucleosis in the acute stage, mononucleosis during convalescence, accompanied by a reappearance of eosinophiles and mast cells and by the appearance of myelocytes. The understanding of this reaction process, the distinct occurrence of which points to a successful termination of the suppression, is not without value both in prognosis and treatment.'

"As a matter of fact it is not until about the 40th day after withdrawal that the blood curves reach normal. This is why, when we add to these 40 days the state of preparation for withdrawal, it is necessary to continue treatment for from 50 to 60 days before the patient has really finished his convalescence and is in condition to take up his work again. Sixty days considered as an average necessity, and quite enough for competent practitioners of this method of rapid withdrawal, is not arbitrary but corresponds fairly accurately to the time required by the organic restoration of which the blood picture is an index of prime importance and of exact evaluation.

"I am here reporting the statistics of 300 cases treated at the Sanatorium of Boulogne since July, 1897. They comprise 202 men, 50 doctors, 3 dentists, and 4 pharmacists and 98 women.

"According to the drugs employed they may be classed as follows: 235 pure morphinists; 18 morphino-cocainists; 37 heroinists; 3 morphin or heroin cocainists; 1 chloralist.

"The yearly percentages of these different kinds of addicts is interesting. The morphino-cocainists who represented 16.67 per cent of cases treated in 1897 and 29.40 per cent in 1898 fell to 4.54 per cent in 1900 and 3.33 per cent in 1907, in some years disappearing entirely. Heroinism on the contrary appeared in 1902 with 10 per cent and increased progressively to 17.39 per cent—1903, 21.05 per cent--1904, 25 per cent—1905, 21.42 per cent—1906, 15.15 per cent—1907, 19 per cent—1908, 23.07—1909.

"This occurred because the mistake of using cocaine as a substitute for the cure of morphinism was recognized,—a mistake that was replaced by a worse one, that of believing that heroin was endowed with all of the advantages of morphin without its objections, particularly that of addiction-formation.

"To-day a new erroneous belief is being spread, that of considering dionin as a substitute for morphin and some have already begun to spread this idea in relation to a new opium preparation, pantopon. When will it be realized that all the derivatives of opium, whatever they are, have the same objections, the same dangers, and lead to the same addiction, and that the only way of curing an addict is not to give him another poison, but to remove the one he is taking? We even find physicians and medical works advising methods to check the phenomena of elimination or withdrawal, such as the diarrhoea, which they consider a fortuitous circumstance!

"Of what does the method employed in these 300 cases, without the necessity of giving up detoxication for any reason whatsoever, essentially consist? Its technique is to-day very definite and comprises 4 stages: first, preparatory reductions; 2nd, withdrawal; 3rd, active stage of elimination; 4th, convalescence.

"*The Preparatory Period* lasts for from 5 to 8 days according to the degree of intoxication, the general state of the patient, the functioning of certain organs (intestine, liver, heart, kidney). It is made use of on the one hand to reduce the amount of drug used progressively and according to certain indications shown by the reactions of the patient. (In the case of a morphino-cocainist, it is necessary first to withdraw the cocain, which is done without difficulty; with a heroinist, it is necessary to replace the heroin at once with about double the dose of morphin.)

"On the other hand, this period is made use of to bring the organism into good condition from the point of view of the elimination of products changed by the poison.

"For this purpose and, first of all, purgatives are given, but only certain ones: calomel and seidlitz. Formerly it was advised to purge the patients once or twice at the time of withdrawal. I soon discovered that this was not enough, and for the last 15 years especially since I realized what the true physiologic mechanism of demorphinisation was, I have been using seidlitz more and more, not only during the preparatory period but for a long time after withdrawal.

"The patient should be purged every day and not until the alvine discharges have been continuously and abundantly set up should one proceed with withdrawal. To withdraw a morphinist who is still constipated is to expose him to all of the serious symptoms which have been previously described and which cause him to dread suppression by the rapid method.

"To-day, through the use of the method which I have advocated for so long and only because of experience with it, these symptoms are no longer to be feared and it is years since I have seen a case of syncope during the course of withdrawal, while it was a very common, in fact almost constant, occurrence formerly.

"It would be a mistake to think that the repeated purging of patients to prepare them for complete detoxication, withdrawal, is enough. The liver and the intestine are not the only channels of elimination for the changed elements resulting from the poisoning, especially with morphin or its derivatives.

"It is necessary to act on all of the glands which are able to store up morphin: the skin glands, the salivary glands. Baths, warm douches, light baths are useful in the first instance; pilocarpin on the day before or the day of withdrawal, cleans out the second ones. Finally it is necessary to make sure of the regular functioning of the kidneys and of their complete cleansing.

"*The Second Stage* is that of withdrawal. The excretory ducts of the glands being freed, the hypersecretion which results from the stopping of the poisoning easily escapes. The heart is not required to do extra work and remains at almost its normal rate; hence syncope need not be feared. The particular pains and nervous irritability belonging to this stage, and arising from the effort of the body to free itself, and this effort being reduced to a minimum, are also reduced to a minimum. The muscles alone, which have no excretory channels, are the seat of irritability and twitchings, which are however relieved by frequent short, warm baths. During this stage which lasts for from 24 to 30 hours the intestinal evacuations should be kept up so that the patient will not go for more than 4 hours without movements. As soon as there is a tendency for them to stop seidlitz water should be given which besides is always given during the first 2 days of withdrawal, morning and evening. The more free the evacuations the more active and prompt is his reaction and the less he suffers.

"By following this method one is especially struck with one fact, namely, that at the end of 24 hours after the last injection the desire for morphin disappears.

"*The third period* comprises the 8 or 10 days which follow withdrawal during which the organism continues very actively to free itself from all of the elements affected by the poison. The liver especially, always more or less contracted during morphinism, regains its size and secretes large quantities of bile. The whole digestive tract, from the tongue throughout the intestine, sheds its mucosa; the skin desquamates; the color becomes more normal; albumin disappears from the urine and abscesses heal.

"Baths, douches, daily purgations with seidlitz water together with rest in bed, which should be maintained from the first day of treatment, are the only indications during this period. Formerly, and until about 1895, I insisted on feeding these patients as much as possible during the first three periods. I had soon abandoned giving them at the time of withdrawal, as is advised in journals, port wine or other stimulants. But I gave them bouillon, milk, meat juice and meat jelly.

"I recognize the uselessness of this and now I keep these patients on an absolute diet for the first day of withdrawal with the exception of acid lemonade and then coffee when their stomachs can stand it. After this feeding is increased quickly and follows the patient's own desires during the week of withdrawal. The loss of weight which occurs, caused particularly by the organic dehydration, is quickly made up from the first week on.

"*The fourth period* is that of convalescence. It is characterized by the return of the appetite, a voracious one, with extremely rapid digestion which allows the patient to take several large meals a day. He takes on an average of 2 kilograms a week and often 2½, 3 or even 5 kilograms as happened in men of robust constitution.

"During this stage the body is yet far from being freed from toxic products, as is shown by the examination of the blood and eliminatory crises, which I have mentioned according to Westphal, will occur unless care is taken. These are very undesirable as they cause a state of discomfort which reawakens the desire for morphin which has disappeared from the day after withdrawal. To avoid them intestinal, hepatic and cutaneous elimination should be carefully stimulated. The activity of the sexual glands which is reawakened very intensely about the 15th or 20th day does not require any stimulation. For skin elimination warm baths and douches suffice.

"For hepatic and intestinal evacuations it is necessary to employ calomel from time to time according to the condition of the liver and to give seidlitz water daily for the first 20 days, then every 3 or 4 days or whenever there is a tendency for intestinal activity to lessen.

"It is surprising how well patients accept these repeated purgings. After a while they ask for them whenever they do not feel well.

"It should be stated that the more they are employed the quicker does their appetite and weight return. It is interesting to see how little these purgations trouble them; half an hour after taking a glass of seidlitz water they are able to repeat, their appetite is in no way affected nor is their digestion.

"Such are the fundamental principles of the physiologic detoxication of morphin addicts and addicts to analogous poisons.

"There are many other things that might be said as to the way in which these general rules should be applied and as to the conditions under which they are best used. There are, of course, many details, many individual circumstances, which require emphasizing on this or that point or omitting in another. The main consideration which must not be lost sight of is to facilitate, stimulate and maintain the most active elimination possible chiefly through the repeated use of purgatives. Consequently nothing should be given to check this elimination and nothing which might add another addiction to the one which is being treated. I cannot insist too strongly on this important point; no substitutes, no analgesics, no hypnotics. In connection with these latter, I would especially mention the immediate and disastrous action of trional, sulphonal, and similar products in recently detoxicated cases who pass quickly, even though small doses only are taken, into a state of hebetude in which they resemble general paralytics.

"Is this method which I have used for 20 years and which has never failed me, the last word in detoxication? I do not claim it and after having perfected it to as considerable a degree as possible I still see details which might be improved. The chapter on intoxications and still more that on detoxications is still far from being clear and there are many discoveries yet to be made. I believe however after a wide experience that what I have told you, in its fundamental principles, gives the greatest degree of accuracy in its application, the maximum of safety in withdrawal and the maximum chance of cure—not only immediate cure, because withdrawal always succeeds, but a permanent cure without relapse—and along with this the shortest treatment and the least difficulty at the time of withdrawal."

William Osler—1894.[31]

"The treatment of the morphia habit is extremely difficult, and can rarely be successfully carried out by the general practitioner. Isolation, systematic feeding and gradual withdrawal of the drug are the essential elements. As a rule the patient must be under control, in an institution and should be in bed for the first ten days. It is best in a majority of cases to reduce the morphia gradually. The diet should consist of beef-juices, milk and egg-white, which should be given at short intervals. The sufferings of the patient are usually very great, more particularly the abdominal pains, sometimes nausea and vomiting and the distressing restlessness. Usually within a week or ten days the opium may be entirely withdrawn. In all cases the pulse should be carefully watched and, if feeble, stimulants should be given, with the aromatic spirits of ammonia and digitalis. For the extreme restlessness a hot bath is serviceable. The sleeplessness is the most distressing symptom, and various drugs may have to be resorted to, particularly hyoscine and sulphonal and sometimes, if the insomnia persists, morphia itself."

* * * * *

"The condition is one which has become so common, and is so much on the increase, that physicians should exercise the utmost caution in prescribing morphia, particularly to female patients. Under no circumstances whatever should a patient with neuralgia or sciatica be allowed to use the hypodermic syringe, and it is even safer not to intrust this dangerous instrument to the hands of the nurse."

James Tyson—1900.[32]

"Successful treatment is scarcely possible outside of an institution and even within one serious difficulties beset the way, the chief of which is the deception practised by the patient. Patients should be divested of their own clothing and put to bed in hospital garb, because in this way alone can we be sure morphine is not concealed about the person. In the case of women, whenever possible, a special nurse should be assigned to each case. The latest testimony favors complete and sudden withdrawal of the drug as furnishing a short struggle, though a severe one. Such treatment is usually followed by diarrhoea, vomiting and insomnia. Some counsel even that no adjuncts should be employed, but certainly there can be no harm in the employment of general tonic treatment and remedies directed to the irritability of the stomach and torpor of the liver. A calomel purge is useful at the start. It is a well-established fact that, as in alcoholism, the patient should be well nourished, given such foods as milk, cream, beef-juice, or beef-peptonoids, rich broths and beef-tea. When there is great asthenia, aromatic spirits of ammonium, strychnine, and digitalis may be given, as directed under alcoholism. If possible, an occupation of an absorbing kind should be furnished. In most cases it is impossible to secure the consent of the patient to sudden and complete withdrawal when the gradual plan must be adopted. The success of either plan depends on securing effectual control of the patient, and if this cannot be obtained all efforts fail.

---

[31] Osler, W.—The Principles and Practice of Medicine. 1894.

[32] Tyson, J.—Practice of Medicine. 1900.

"To promote sleep, one of the numerous hypnotics of which the present day is rich should be given. Chloralamide is probably the best of these. It is not easy of administration, because of its pungent taste and difficult solubility. Twenty grains (1.32 gm.) or thirty grains (1.98 gm.) are a moderate dose, and are easily soluble in a fluidrachm (3.7 cc.) of a mixture of two parts alcohol and one part glycerine. Of such solution two teaspoonfuls should be given in a glass of sherry wine or four tablespoonfuls of milk at the ordinary temperature. Trional and sulphonal or somnal may be given in from fifteen- to twenty-grain (0.99 to 1.32 gm.) doses dissolved in hot water. Hyoscine in doses of 1/96 grain (0.07 gm.) may also be tried. Chloral itself may be used in doses of from ten- to thirty-grains (0.66 to 1.98 gm.). If there is cardiac weakness, the dose should not exceed ten grains (0.66 gm.). Chloralose may be given in from five- to ten-grain (0.33 to 0.66 gm.) doses in wafers or in hot milk. Too much carelessness is practiced by physicians in placing morphine in the hands of patients. On the other hand, when morphine is judiciously ordered for patients suffering extreme pain only, it is very rarely the case that a habit is established."

M. K. Lott—1901.[33]

On May 14, 1901, Lott in a paper read before the Brazos Medical Association, Texas, described his method of treatment as follows:

"I have examined the works on therapeutics at my disposal, and I have been unable to find more than a hint at the value of the different remedies which I use and will discuss in this paper. What mention I have found has been brief, and, usually, condemnatory. The statements made by most of the authorities I have consulted, are entirely at variance with my experience with the remedies referred to. I have experimented with them for the past three years, and in some twenty-five cases, and I feel that it is but right that I should give this Association and the profession generally, the benefit of that experience."

* * * * *

"In the treatment for the morphine habit, or other opiates, or chloral or chloroform, no preparatory treatment is necessary. It is best to begin while the patient is well under the influence of his daily dose. He sleeps longer, and is more quiet than if treatment is deferred until about the time for the patient to take his daily potion."

---

[33] Lott, M. K.—The Drug Habit: Its Treatment—Texas Med. Jour. Nov., 1901. Vol. XVII. No. 5, p. 157-162.

"The remedies are but few, and most, if not all of them are quite familiar to the profession. They are in almost daily use. They are: Duboisine, atropia, strychnia, and the hydrobromate of hyoscine, hyoscyamine, pilocarpine. I have used all of these, but prefer the hydrobromate of hyoscine as the safest and most easily controlled. I usually begin the treatment by securing a quiet well ventilated room with but a moderate degree of light, and so arranged that the light can be excluded, for, under the influence of hyoscine, or atropine, the pupil is widely dilated, and if there be too much light the eyes are liable to be injured. I secure a careful, competent nurse. He or she should be strong and able to handle the patient, if necessary, for sometimes, if too much hyoscine be given, the patient will require to be protected against self-injury. The room should be downstairs preferably. The patient should be given a good bath and put to bed. I give 1/100 gr. of hydrobromate hyoscine, and after this I give 1/200 gr. from thirty minutes to one hour for from twenty-four to forty-eight hours, until the patient has taken from forty to sixty doses, sometimes decreasing it, and sometimes omitting a dose altogether, watching carefully the pulse and respiration. The object being to secure hyoscine intoxication, which is readily recognized by the restlessness, dilated pupils, dry throat, hallucinations, etc., which it produces. When this stage is reached, I give the drug just often enough to keep up the delirium from twenty-four to forty-eight hours.

"It may be necessary during this period, to give a small dose of morphine, even one-fourth grain, once, twice or three times; it will not affect the result in the end.

"Generally it is not necessary during this period to give anything else, though it may be necessary to give strychnia, or nitro-glycerine, or digitalis for the heart; but always remember that hyoscine antidotes morphine, and that morphine antidotes hyoscine. If the patient should get too much of one, I give the other.

"Usually the first few hours, sometimes for four or six hours, but in some instances a much longer period, the patient sleeps. In one instance the patient slept twenty-two hours. The pupils become widely dilated, and the mouth and throat are very dry, and the patient loses the power of co-ordination and would be unable to stand, if permitted to get out of bed; he would likely fall and hurt himself. For this reason, a nurse is constantly at the bedside. Usually after a few hours' sleep a delirium comes on and the patient is quite wild. He imagines that he sees and does things that do not occur. If specks are on the quilt, the patient is likely to imagine them to be chinches, and may spend hours picking them off, often remarking on their appearance and number.

"During this period it is necessary to give the patient water frequently, as the throat and mouth are very dry. At the end of this period, generally, the patient is permitted to come from under any drug, and after a few hours reason is restored. The patient expresses himself as cured. He no longer craves the drug and would not take it.

"At the end of the first stage of treatment, the hyoscine, duboisine, or whichever of the group you have been using, should be left off; and begin a second stage of the treatment with pilocarpine in one-eighth grain doses, which is to be repeated every hour until its physiological effect is secured, then the time between doses is to be lengthened and kept up sufficiently often to maintain the effect, which is elimination of the drugs that have been stored in the cord and in the body; or in other words, until the last vestige of the symptoms of hyoscine have disappeared. The characteristic sneezing and attempting to yawn now commences.

"During the past forty-eight hours no nourishment, or very little, has been taken, and the diarrhea has commenced. This will be likely to vex the patient for some days to come, and until now the urine has been scant and high colored.

"At this period, the end of forty-eight hours, the patient has been relieved of the morphine, and thus far there has been very little or no suffering. And now pain in the knees, elbows and the back often sets in. Sometimes there are cramps. These are to be relieved, and here the ingenuity of the physician is called into play; for the next few days the real battle is on, and the necessities, real or imaginary, of the patient are to be met.

"For the diarrhea, give sub-gallate of bismuth in 30 gr. to 60 gr. doses, with fd. extract of coto bark in 20 to 30 drop doses in water at the time of giving the bismuth. This will relieve the diarrhea in a few days. It is at this time the use of pilocarpine 1/8 gr. and strychnine 1/20 gr. or 1/30 gr., hypodermatically, should be given. Under this treatment, the dryness of the mouth and throat passes away, the urine clears up, the skin becomes moist, and the appetite begins to return, and in a week or ten days the stomach will digest almost anything you offer, and the progress is faster. But the patient is nervous and restless. He sleeps poorly, and there are the pains in the limbs and back. For these and the sleeplessness, a bath either hot or cold, or the Faradic current, will be found very beneficial. Under these methods the sleep will soon come naturally. But it may be advantageous sometimes to give large doses of the bromides of potassium, ammonium and sodium a few times, even adding chloral if necessary. But usually it is best to wait for a natural sleep. The pains can be relieved by rubbing with liniments, or by electricity, bathing, pilocarpine, strychnia, atropine, or a few doses of hyoscine."

G. E. Pettey—1901-1913.[34] [35]

In October, 1901, Pettey published his first paper on chronic opium intoxication in which he introduced his method of treatment.

Although amplified and enlarged upon, Pettey's method of treatment introduced at that time remained fundamentally the same throughout the years of his practice. The following is an abstract of the procedure taken from his book published in 1913.

The author does not approve of the gradual reduction method of treatment. This method, he states, seems to be based upon the idea that the narcotic in the system constitutes the *sum total of the malady* and that when the last of the drug is withdrawn the patient will be cured, while as a matter of fact he believes that it is a comparatively minor factor in the symptoms which develop, which are due more to the other poisons which it imprisons in the system. Its withdrawal without the removal of these other irritating poisons will not be attended with success. He states that when the narcotic is reduced to any considerable extent below that to which the patient is accustomed, the nervous system begins to feel the irritating effect of the toxins of auto- and intestinal origin with which the system is saturated and in response to this irritation the various manifestations of distress develop.

---

[34] Pettey, G. E.—The Narcotic Drug Habits and their Treatment. Therap. Gaz. 1901. Vol. 17. p. 655-662.

[35] Pettey, G. E.—Narcotic Drug Diseases and Allied Ailments. 1913.

In regard to abrupt withdrawal he states that authors who consider the use of narcotic drugs a mere vice insist upon their immediate withdrawal and advise it without any regard for its consequences to the patient.

In explanation of the actual treatment followed, the author states the following propositions:

"1. The essential pathology of narcotic drug addiction is a toxemia, the toxins being of drug, auto- and intestinal origin.

"2. At least six of the most troublesome and dangerous complicating symptoms have their origin in a perverted function, viz.: deficient excretion. These are intestinal colic, nausea, vomiting, labored and deficient heart action, and collapse. By thorough elimination these may be prevented altogether, and a number of the other symptoms of nervous and mental origin greatly modified, if not avoided.

"3. The motor function of the bowel is the function most impaired by the effects of opiates.

"4. Purgatives, secretory stimulants, as ordinarily given, which excite intestinal motion by reflex action, do not sufficiently restore that function to bring about effective emptying of the intestinal canal of a drug user.

"5. In order to empty the intestinal canal of a drug user direct, positive stimulation of the motor centers is essential, strychnine being the most suitable agent for this purpose.

"6. Since in narcotic drug users all the nerve-centers are profoundly impressed with the narcotic, resulting in extreme lethargy of intestinal motion, larger than ordinary medicinal doses of strychnine are required to overcome this lethargic state and excite efficient peristalsis.

"7. If the motor activity of the bowel be efficiently induced and maintained by direct stimulation of the motor centers with strychnine, no larger quantity of the glandular stimulants is required to promptly and fully empty the intestines of the drug user than in those not using the drug.

"8. If free peristaltic action is excited while the system is still under the sedative influence of morphine, little, if any, distress occurs and the intestinal canal can be thoroughly and promptly emptied.

"9. Strychnine, if given in sufficient doses, will excite active peristalsis, notwithstanding the restraining effects of the opium.

"10. Unless efficient provisions for the prompt and full excitation of the motor function of the bowel be made, any secretory stimulant given will merely excite excessive secretion in the upper part of the intestinal canal, accompanied by griping, nausea, vomiting, and other distress, but will be unable to empty the canal, reflex action alone not being sufficient to induce peristalsis when the nerve-centers are so benumbed by narcotics.

"11. Deficient heart action leading to collapse in these cases is mainly due to portal engorgement.

"12. When the intestinal canal has been thoroughly cleansed and portal engorgement overcome, morphine or other narcotics can be at once withdrawn from an habitué without danger to life and without the occurence of shock, diarrhea, colic, vomiting, or the slightest appearance of collapse.

"13. A general hyperesthesia follows the withdrawal of opiates from a habitué, this being the natural reaction from the state of chronic anesthesia to which the drug user has been accustomed. This extends to all of the functions of the body, mental as well as physical.

"14. The severe suffering incident to the abrupt withdrawal of opiates, after thorough elimination has been carried out, has a natural limit of a few days' time. This suffering, severe as it would otherwise be, can be obviated and these days passed in comfort by the discreet administration of scopolamine.

"15. The therapeutic use of scopolamine, for the time it is required in these cases, does not in any way perpetuate the desire or necessity for the use of an opiate. While it relieves pain, induces sleep, and overcomes those distressing symptoms of nervous origin that follow the withdrawal of morphine, its action so opposes the effects of the opiate that, instead of perpetuating the effects of the morphine, it stimulates the centers which have been benumbed by that drug and shortens the time during which its secondary effects would be manifested.

"16. When the patient's system has been thoroughly cleansed from toxic matter, the drug withdrawn, and the patient prevented from suffering with scopolamine for from two to three days, no craving or desire for the drug remains, abstinence symptoms, such as ordinarily follow the withdrawal of opiates, are obviated, and the patient is brought to a condition in which he can pass his time in comfort, eat heartily, sleep from four to six hours out of each twenty-four, and this insures safe and rapid convalescence.

"17. The dose of scopolamine cannot be definitely fixed. The dose varies greatly in different individuals, the range being from 1/300 to 1/50 grain at intervals of from thirty minutes to six hours. At first the smaller dose should be given and repeated at short intervals until sleep is induced, or at least until the patient is free from all pain. After this the dose should be of such size and be given at such intervals as are necessary to overcome all painful symptoms and to keep the patient comfortable. The dose in one case is no index to what will be required in the next; only by a physician experienced in such matters being present and observing the effects of each dose can the proper dose be ascertained and the patient be kept in a comfortable condition.

"18. This patient should not be allowed to suffer. Scopolamine, in remedial doses, does not materially affect the vital functions or leave after-effects on either the mind or body of the patient; therefore, it should be given until its full physiological effects are manifested, if necessary.' To allow the patient to suffer during the treatment impairs his nervous system, lengthens the time during which treatment will be necessary, and materially increases the danger of the relapse.

"19. The period of convalescence during which the patient must be kept under supervision is also considerably reduced, but varies greatly in different individuals. The absence of that train of nervous symptoms, the ability to sleep naturally, to eat heartily, and the improved digestion and assimilation by which the patient rapidly gains in flesh and strength lessen the liability to relapse almost as greatly as this curative plan of treatment lessens the dangers and suffering while under treatment.

"20. The after-treatment in these cases does not consist in the adminstration of drugs, and no drugs should be given unless specifically indicated. There is certainly no place for the administration of alcohol or strychnine in the after-treatment.

"The reduction or suspension of inhibitory control by the effects of alcohol permits an extravagant and premature expenditure of energy, and this is followed by marked depression. This depression is felt to an exaggerated degree by one who has recently been taken off a narcotic drug and such a one will not long tolerate it, but will seek to blunt their sensibilities to it by taking more alcohol. This, in turn, lessens inhibitory control, and energy is again prematurely expended, and this is followed by increased depression.

"Depression from the secondary effects of alcohol calls loudly for a dose of the narcotic to which such a person has been accustomed and if that is taken the person is well on the road to relief. Alcohol in all forms should be interdicted during convalescence and forever after that.

"Strychnine keeps up the active peristalsis and inclines the bowels to empty too often. This interferes with digestion and assimilation and causes diarrhoea by the passage of incompletely digested food through the bowels.

"21. Unloading the intestinal canal and relieving portal congestion lessen the strain under which the heart has been working more than enough to compensate for the loss of the stimulus it derived from the effects of morphine, and, instead of the heart's action being weak or irregular, the character of the pulse is decidedly improved. It has greater volume, is softer, more compressible, and is, in every respect, of better quality than when propelling the blood against the obstruction of an engorged portal system, even though it was supported by morphine. However, should the heart action be weak, or for any reason need support, sparteine sulphate, one to two grains hypodermically, every four to six hours will give it more uniform and efficient support than morphine or any other known drug."

* * * * *

"The author has found the following formula to be a physiologically balanced purgative compound and one that has given excellent results in narcotic cases in his hands:—

℞ Calomel,	
Powdered extract of cascara	aa gr. x
Ipecac	gr. j
Strychnine nitrate	gr. 1/4
Atropine sulphate	gr. 1/50

M. and make 4 capsules. Sig.: One every two hours until 4 are taken, preferably at 4, 6, 8 and 10 P.M., and only after having abstained from taking dinner and supping on the day on which they were taken.

"Thorough elimination of toxic matter from the system is the primary and most essential step in the treatment of morphine.

"The principal obstacle in securing action of purgatives in drug addictees arises from the suspension of peristalsis by the primary effects of the opiates. During a period varying from four to eight hours from the time of taking the dose of morphine intestinal motion is almost, if not entirely, absent; but as the early effects of the dose subside, peristalsis is again gradually reestablished."

* * * * *

To be certain of obtaining good peristalsis, 1/20 gr. strychnin should be given 6 or 8 hours after the last purgative capsule and follow this in half an hour with 2 oz. of castor oil or a bottle of citrate of magnesia. The oil or saline should be repeated at intervals of two hours until the intestinal canal has been thoroughly emptied.

* * * * *

Pettey believes that a period of convalescence of from one to two months should be spent under the direct supervision of the physician. He states:

"Unless a physician has the courage and the therapeutic skill to administer remedies in these cases in sufficient quantities to procure their full physiological effects, he ought not to attempt to treat patients of this class. We must meet conditions as we find them."

A. Morel-Lavallée—1902.[36]

Morel-Lavallée recommends the substitution of heroin in the treatment of morphinism provided that certain precautions are taken, namely, that the patient is never allowed to know what is being substituted or to give himself the drug under any circumstances.

The following is an outline of this author's method.

The author emphasizes the importance of complete control over the patient, of securing the patient's confidence and then of not deceiving him about the dose reductions or other matters, and of unlimited patience and loyalty on the part of the physician and attendants.

---

[36] Morel-Lavallée, A.—Les alcaloides de l'opium, morphine, héroin, dionin. Notes pour la cure de démorphinisation. Emploi de l'Héroine. Rév. de Thérap. Paris, 1902. LXIX. 109-119.

The determination of the *de luxe* dose is necessary. This consists of that portion taken daily that is not required to maintain a physiologic balance. The withdrawal of this portion causes no suffering. It is important to lengthen the interval between doses, i.e., to reduce the number of injections, even though the total amount is not reduced at first. The patient is encouraged to assist in this and in a few days the *de luxe* dose is gotten rid of and the patient's confidence is gained.

Thus the "sustaining" dose is reached. This is maintained for several days. The strength of the solution and the amount of each dose are maintained, but the *number* of doses is now diminished by lengthening the interval. They usually can be reduced to four or at most five injections in twenty-four hours.

At this point the author begins to substitute heroin for the morphin, at first only once a day and only for a part of the dose. The patient does not know of this substitution but notices the delayed effect of the dose and the lessened euphoria. Finally as the substitution progresses these are lost sight of. When heroin is entirely substituted it is gradually reduced, again by lengthening the intervals, as well as lessening the amount until two or even only one dose is taken a day. Tonic treatment is increased as the heroin is decreased. Finally injections of water are reached. The patient should never be told of this latter procedure.

S. Paton—1905.[37]

Paton states that in private practice gradual reduction should be carried on in preference to sudden withdrawal when the daily dosage has been high, as the latter is apt to be accompanied by severe and at times dangerous effects. In a hospital, however, the drug may be withdrawn at once. The author advises against the use of stimulants except when collapse is imminent at which time caffein, digitalis, whiskey, and strychnin are sometimes beneficial. The bowels should be carefully regulated and any attack of diarrhoea should be checked as soon as possible. Restlessness or delirium, he states, may be combatted by a warm pack or continuous bath. Sedatives should be avoided if possible. As a later treatment he recommends cold sprays, massage, exercises, etc.

---

[37] Paton, S.—Psychiatry. 1905.

A. Lambert—1907–1920.[38] [39] [40]

In 1907, Lambert discusses treatment as follows:

> "The best method in the majority of cases, is to endeavor to find approximately how much morphia the patient has been accustomed to and cut it at least in half and give this amount in divided doses for the first twenty-four hours. It is very necessary to bring the digestive tract into as good a condition as possible in the shortest space of time, which is best done by the use of castor oil, in half ounce doses, three times a day, for the first week or ten days. When the patients are very weak, it is advisable to give subcutaneous injections of strychnine (gr. 1/60-1/30, gm. 0.001-0.002), at first every four hours. The best drug to equalize the circulation and to reduce the physical craving and suffering to a minimum, is the subcutaneous use of Livingston's solution of ergot as described under alcoholism. To allay the nervousness, warm baths are often very efficacious. Kane recommends that they be given at a temperature of 112 degrees F., and the patient rubbed down quickly, placed in bed, and covered up warmly. To combat the insomnia, cold packs are often useful. A tonic of nux vomica and compound tincture of cinchona with capsicum, given three or four times a day, is of great assistance. Often in the first few days champagne or sherry is helpful, but this should not be prolonged, for these patients are as prone to take up other habits as they were originally to take up morphia. Chloral as a hypnotic has been condemned by most writers. Levinstein says that it tends to increase the excitement. Kane recommends bromides, given in large amounts of water, even in one hundred grain doses. The patient should be fed with koumyss and eggs as the most easily assimilated food. If accustomed to coffee and tea there is no reason why they should not be continued."

In the 1914 edition of the same book, Lambert states:

> "Most patients addicted to morphine have long ceased to obtain any pleasure from its use. They long to be free from its slavery and dread only the terrible suffering which the deprivation from the drug brings. The question arises whether they should be treated by the slow withdrawal method, in which they are treated symptomatically for whatever symptom seems most distressing, or whether the drug should be withdrawn abruptly, and the patients suffer with full intensity, hoping to relieve them in a shorter space of time, or whether some of the more recent methods, using belladonna or hyoscine, should be employed.

---

[38] Lambert, A.—Chapter on Opium and Morphine in Osler and McCrae's Modern Medicine—1907. Vol. 1.

[39] Lambert, A.—Chapter on Opium and Morphine in Osler and McCrae's Modern Medicine—1914.

[40] Lambert, A.—Chapter on Intoxicants and Narcotics in Nelson's Loose-leaf Medicine—1920.

> "The sudden withdrawal method does not seem justifiable. The danger of sudden collapse and death is not a theoretical one. Morphinism or the opium habit is a chronic poisoning and must be treated as such. The only safe method is by the rapid elimination of the drug in the body, the quieting of the withdrawal symptoms with some preparations of the belladonna group, and as rapid a withdrawal of the drug as the condition of the patient will justify. Under these conditions collapse need not be feared, and the elimination of the poison and the restitution to health is soonest accomplished."

After briefly mentioning Lott's method of hyoscin treatment and Wagner's method of combining hyoscin, atropin and strychnin, Lambert describes the Town's method [41] in detail stating that this method has the advantage that the belladonna and hyoscyamus do not bring the patients to a stage of delirium or to the condition of helpless unconsciousness as hyoscin does. He closes the section as follows:

> "This treatment in my hands in some 600 patients has proved so successful that 80% have remained well. This proves the efficacy of this method of treatment and also that most morphinists, if free from their addiction, are anxious to remain clear."

In 1920 [42] he states:

> "The several methods by which the drug can be withdrawn are easily performed in an institution, but the personal regeneration must in many cases be continued for months instead of weeks before success can be hoped for. Most patients addicted to morphine have ceased to obtain any pleasure from

---

[41] The "belladonna mixture" of the Towns-Lambert treatment is the same mixture as that given in the third edition, 1904, of "The General Practitioner as a Specialist," first published in 1900 by J. D. Albright, M.D., of Philadelphia. The following formula is given as Formula No. 1 of one of several methods of treatment described by the author.

Tr. Belladonna lvs.	fl. 3. VIII-XII.
Fl. Ext. Hyoscyamus	fl. 3. VII.
Fl. Ext. Prickly Ash bark	fl. 3. IV
Glycerine C. P.	fl. 3. III.
Syr. Simple q. s. ad.	fl. 3. IX.

According to Albright a drachm of this mixture should be given every three hours, night and day. After sixty hours, each dose should be reduced by ten minims until none is taken.

This treatment, according to Albright, is to be preceded for three or four days by a reduction of the drug to the lowest amount that will sustain without suffering. During this time as well as later when necessary Formula No. 2, a sedative and tonic mixture, is to be given, followed by a ten grain dose of calomel which should act before No. 1 is begun.

[42] Loc. cit.

the use of the drug. Many long to free themselves from its slavery and dread only the suffering that the sudden withdrawal produced. Immediate cessation of the use of the drug without any treatment in these patients is not justifiable; the physical suffering is too intense and its endurance is not necessary. Furthermore, the danger of sudden death is not a theoretic one in the case of the morphinist. A number of methods are used for withdrawal."

Again he mentions Lott's treatment and describes Braunlich's method used in the New York City Health Department.

Again pointing out the advantage of the belladonna treatment mentioned above, Lambert describes it as follows:

"The belladonna treatment has the advantage that the belladonna and hyoscyamus are not pushed to the stage of delirium nor is the patient unconscious at any time, as in the hyoscine treatment. These drugs are never pushed beyond the state of dry throat and dilated pupils and the patients retain their consciousness and freedom of action throughout the treatment. When it is completed, the patient does not express physical craving for the drug; there is real obliteration of the narcotic craving. The belladonna mixture used consists of two parts of a fifteen per cent tincture of belladonna and one part each of the fluid extract of hyoscyamus and xanthoxylum. Patients differ widely in their tolerance of this mixture. It matters not in the treatment how much or how little of the mixture is given, provided the limit of tolerance of belladonna is reached. Some patients will not tolerate more than two drops as a hourly dose, while in others it is necessary to push the dosage up to fifteen or twenty drops. The bottle containing the mixture must be kept well corked and shaken before using. It is best to give it in a capsule, as in liquid form it produces nausea from the monotony of the taste. On the evening before the beginning of the treatment, the patient is given three to five compound cathartic pills and, if very constipated, five grains of blue mass. Six hours later these are followed by a saline. When the bowels have acted thoroughly two or three times, the patient is given, in three divided doses at half-hour intervals, two-thirds or three-fourths of the total daily twenty-four-hour dose of morphine, opium, or heroin to which he has been accustomed. The larger amount of the drug is better if the patient can take this amount. One should observe the effects carefully, however, after the second dose as the amount then equals four-ninths or one-half of the total twenty-four-hour dose. Some patients cannot comfortably take more than this at one time. With the last dose of morphine six drops of the belladonna mixture are given in a capsule."

* * * * *

"This belladonna mixture in doses of six drops (not minims, but drops dropped from a medicine dropper) is given every hour for six hours. At the end of six hours, the dosage is increased two drops. The mixture is then continued every hour, day and night, throughout the treatment, increasing two drops every six hours until sixteen drops are taken, after which it is kept at this dosage, or it may be increased still further if the patient does not show any belladonna symptoms up to this time. It should be discontinued if the patient shows dilated pupils, dry throat, or redness of the skin, or if the voice assumes a peculiar incisive tone and the patient becomes insistent on one or two ideas, these latter being the beginning symptoms of belladonna delirium. The mixture is begun again, at a reduced dosage of about one-half the amount at which it was stopped, after the belladonna symptoms have subsided. This is usually after three or four hours. Ten hours after the initial dose of morphine the patient is again given from three to five compound cathartic pills, with or without five grains of blue mass. In elderly patients or in patients who are physically weakened, these unusually large doses of cathartics are unnecessary, but the majority of patients feel better if thoroughly purged. These cathartics should act in three to six hours and are always followed after six hours by salines. When these have acted thoroughly, the second dose of morphine is given; this is usually about the eighteenth hour. This should be one-half the first dose given; that is one-third to two-thirds of the original daily dose. The belladonna mixture is still continued, and ten hours after the second dose of morphine, that is about the twenty-eighth hour, compound cathartic pills are given again, followed by saline six hours later. After they have acted, at about the thirty-sixth hour, the third dose of morphine is given, one-sixth or three-sixteenths of the original dose, i.e., half of the second dose. This is often the last dose that is necessary, though it may be easier if a fourth dose is given. Ten hours after the third dose of morphine, the same cathartics are given, followed by saline. If a fourth dose of morphine is given, it should be half the third dose. During the period between the third and fourth, or even between the second and third dose, if the patient becomes restless and uncomfortable previous to the giving of the cathartics—that is during the ten-hour period after the morphine—he may be given codein hypodermically, one to five grains as may be necessary to quiet him. About eighteen hours after the last dose of morphine is given and after the cathartics and saline have acted, a bilious green stool begins. The cathartics are now discontinued for twelve or eighteen hours, and the belladonna is cut off; the patient is then given one or two ounces of castor oil as a final dosage. If, at any time during the treatment, the patient experiences nausea, calomel may be given in small doses at half-hour intervals instead of the cathartic pills. Sometimes it is necessary to discontinue the belladonna mixture for twenty-four hours after the last dose of morphine is given, using codein to ease the discomfort before the bilious stool appears.

"Recently it has been found in accordance with Gwathmey's recommendation, that if narcotics are given hypodermically with magnesium sulphate, their value is increased from 50 to 100 per cent. From 15 to 30 minims of a 25 per cent solution of magnesium sulphate can be used but it is too concentrated and is absorbed slowly; 30 to 60 minims of a 125 per cent solution acts more quickly. One-eighth of a grain of morphine given with the sterilized chemically pure solution of magnesium sulphate intramuscularly, or one or two grains of codein with magnesium sulphate, acts to quiet the restlessness of these patients better than large doses of morphine. Hypodermic injections of the magnesium sulphate solution with a small dose of codein at four- to six-hour intervals, or more often, will quiet muscular pain and restlessness better than any hypnotic. It is often wise, during the treatment of these patients, to give them strychnine or digitalis if the pulse seems at all weak, although in recent years this has been done much less than formerly, as the necessity does not seem to arise. Sometimes after the thirty-sixth hour the patient's stool will become clay-colored, but the use of oxgall in small doses is effective in stimulating further biliary secretion. Pain in the legs and knees during withdrawal are relieved by phenacetin and caffein or by pyramidon and the salicylates or two or three grains of sodium nitrate every two to four hours will ease the incessant aching. It is noticeable that magnesium sulphate added to the small dose of codein has greatly reduced the necessity of the other drugs.

"Many patients experience abdominal pains which are not connected with the cathartics and they also suffer from general apprehension. It is well to give these patients ten grains of chloral and fifteen to twenty grains of sodium bromide for four or six or eight hours; this seems to reduce their restlessness and apprehension, does much to make them comfortable, and helps, besides to diminish the abdominal reflexes, which in some instances cause a good deal of trouble. Sodium bromide continued for twenty-four or forty-eight hours in diminishing doses after the treatment has ceased, does much to relieve sleeplessness from which most of the patients suffer. If the patient shows an idiosyncrasy against codein and it produces a redness of the skin and a rash, dionin may be substituted."

G. F. Butler—1908.[43]

"The general outline will consist of substituted sensations, substituted ideas, and general tonic and supportive treatment. To accomplish the former purpose, after almost complete withdrawal of the drug has been brought about, codeine, heroin, dionin, hyoscine may be used to create a sense of euphoria, which differs in some respects from the old euphoria of the drug. One of the best hypnotics is a combination of sulphonal with a vegetable narcotic like conium or hyoscyamus. The bromide salts in large doses may be employed. The morphine user is always a victim of toxemia from arrested functions of the kidneys, liver and adrenals, and intestinal antiseptics, laxatives, and cathartics are a necessary part of the treatment. Hydrotherapy properly employed is invaluable. Static electricity or electric baths are of great value in some cases, but not in all. The immediate surroundings of the patient should be made as pleasing as possible. Food and medicine should be given in the most agreeable forms consistent with usefulness, and the same kind of attention paid to every method of treatment employed."

* * * * *

"The treatment of so dire a malady—for such the chronic use of opium must be regarded—demands the utmost forethought, patience and tact. The method of sudden, absolute withdrawal of the drug is admitted by the wisest observers to be fraught with danger commensurate with that of the indulgence to be overcome. Collapse, delirium, and other serious results have attended so drastic a measure, the general opinion obtaining today being that a gradually reduced dose of the drug is the safest and most rational mode of procedure."

---

[43] Butler, G. F.—A Text-book of Materia Medica, Pharmacology and Therapeutics. 1908.

E. S. Bishop—1912-1920.[44] [45]

Since 1912, Bishop has written numerous articles on the treatment of chronic opium intoxication. A detailed discussion is found in his book, 1920, as follows:

"In a paper, 'The Rational Handling of the Narcotic Addict,' read before the Section on Pharmacology and Therapeutics, Annual Session of the American Medical Association, 1916, I stated, 'It is not my purpose to enter into discussion of the various therapeutic methods and therapeutic measures which have been advocated and employed in the treatment of narcotic addiction. Their number is legion, and they include most of the therapies known to lay as well as to medical literature.

" 'Their multitude is conclusive proof of lack of conception and of understanding of addiction-disease in the past. They have been directed towards incidental and complicating manifestations. They have no more place in the treatment of the addict than they have in the treatment of any other disease condition. I know of no medication that can be called "specific" in the arrest of the mechanism of narcotic drug addiction-disease. There is no more of a specific remedy for narcotic drug addiction than there is for typhoid or pneumonia. The wide advertisement of treatment based on supposed "specific" action of the products of the belladonna and hyoscyamus and similar groups is unfortunate. They have, in my opinion, no action as curative agents in narcotic drug addiction-disease which can entitle them to consideration as specific or special curative remedies. The drugs of this group are useful in many cases, intelligently applied to meet therapeutic indications. They exhibit wide variation of action and reaction in narcotic drug addicts at different clinical stages and under different clinical conditions, and their dosage presents an extremely wide range of individual measure. They are dangerous drugs in the hands of the inexpert or careless, or used in a routine manner or dosage. The status which they have acquired as specific medication in narcotic addiction disease I hold to be a medical fallacy which should be strongly opposed and early remedied.' "

* * * * *

"We are nearing the end of consideration of routinely applied procedures, in all diseases. In addiction we are entering upon a stage of attitude and handling in which there shall be in each case comprehension of intrinsic elements and appreciation of their relative importance, and in which there shall be competent interpretation of symptomatology and competent selection and application of therapeutic measures, placing our efforts on a rational basis and adapting handling and treatment to the needs of the individual.

---

[44] Bishop, E. S.—Morphinism and Its Treatment. Jour. Amer. Med. Assn. May 18, 1912. Vol. LVIII. pp. 1499-1504.

[45] Bishop, E. S.—The Narcotic Drug Problem. 1920.

"Our stumbling-block in the past has been that our minds have been too much focused upon the mere use of narcotic drug and upon the stopping of drug use and too little upon the individual we were treating and the mechanism of his disease. We have tended to apply our remedial efforts to narcotic use instead of to narcotic drug addiction-disease."

* * * * *

"The one great point to be kept in mind is that narcotic addicts are sick; sick of a definite and now demonstrable disease. This disease is variously complicated and widely variable as it occurs in individual patients. Although some individuals, afflicted with this disease, may require custodial or correctional handling—the fundamental physical disease cannot be properly arrested nor handled successfully by mental, moral, sociological or penological methods only. Any toxic, worried, fear-ridden or suffering sick man may show psychological or even psychiatrical manifestations or complications, but observing and attempting to control complications only will not cure basic disease.

"Even if it should some day develop that a serum can be produced against the underlying toxins of addiction-disease; and this is not beyond the bounds of possibility; its usefulness and application must remain for the present matters of academic speculation. Other than this possibility, there seems practically no hope of a properly called 'specific medication' in narcotic drug addiction-disease. Even with its discovery, it is highly improbable that a routine treatment applicable to all cases could ever be successfully adopted. In the very few disease conditions in which we can properly be said to have 'specific' medication, routine handling and treatment of all cases is inadvisable and unsatisfactory."

* * * * *

"Intelligent addicts well know that other factors being equal, the less number of times in a day they take their drug, the less constipated and more normal they are, and the smaller amount of narcotic drug they require to maintain them physically and mentally competent. It is unfortunate that this therapeutic principle so widely recognized among intelligent addicts has not received full recognition and therapeutic employment by all of those who handle and treat addiction-disease. Its probable explanation is very simple—apparently a period of inhibition follows the administration of narcotic or opiate drugs; and the length of this period is not in ratio to the size of the dose administered. Consequently the fewer number of times in a day a dose of narcotic drug is administered, the greater amount of competent metabolism is present—the more adequate is the patient's elimination and nutrition—the smaller amount of opiate or its product lies stored in inhibited and atonic cells, and the smaller amount of antidotal substance is manufactured for the protection of the body, and to some extent, the smaller amount of opiate is required.

"In caring for the narcotic addict, therefore, one of the most important therapeutic measures is the regulation of the interval of his narcotic drug administration. I have repeatedly experimented upon addicts who were not confined or under restraint in any way. I explained to them the inhibitory effects of too frequent dosage and instructed them to use the amount of drug they found necessary for twenty-four hours in large doses at longer intervals. This procedure alone, in many cases transforms the pallid, starved, constipated and deteriorated addict within a surprisingly short time into a well-nourished, well-reactive and practically normally functionating individual. With the return of health, vitality, and normal nutrition and elimination, his body requires still less drug and he voluntarily and without mental struggle and nervous strain reduces the amount of drug used. I wish to emphasize that in these experimental cases there were no other therapeutic measures employed in the way of medication."

* * * * *

"It is evident, therefore, that upon the intelligent and competent estimation, measure and control of physical narcotic drug balance and inhibition of function depend the reaction, well being and therapeutic progress of the man who has narcotic drug addiction-disease. These factors also markedly influence the action of all medication, including the drug of addiction, upon the body of the opiate addict. They influence the reaction of the addict's body to all medication. Medication cannot be intelligently administered to the opiate addict unless those who administer it have understanding and clinical appreciation of the widely varying reaction of the addict under different conditions of drug balance and inhibition of function. Failure to recognize and appreciate this fact explains a considerable portion of the past failures and the past mortality attending specific and special methods and treatments, and so-called 'cures.' The dosage of medication administered and the time of its administration should therefore be determined upon with watchful eye to the reaction of the patient, and with intelligent comprehension of the possibilities in reactionary change."

* * * * *

"The method of gradual reduction of dose to the point of ultimate discontinuance is practical and feasible under conditions and at an expense of time and money which are possible to but very few addicts. The forcible reduction of dose without regard to the environmental, mental, economic, physical or other conditions of the average and individual addict, and absolutely ignoring the considerations of the mechanism and symptomatology of his addiction-disease is barbarous, harmful and futile. Enforced reduction of dose below the point of body need is not worth what it costs in nerve-strain, suffering and physical inadequacy. The extent of addiction-disease and the degree of progress in its remedy cannot be measured in terms of amount of drug administered. It must be measured in terms of clinical symptomatology, just as progress is measured in any other disease. Reduction of dose below the amount of body need, prior to the stage of final withdrawal, constitutes a serious therapeutic handicap and is most decidedly contra-indicated. Withdrawal of opiate from an addict whose physical reaction and strength and nerve force have been reduced and depleted by continued reduction of amount of drug without commensurate reduction in the extent of body need is harder than withdrawal from a reactive individual with reserve nerve and physical force who may be taking a much larger dose."

* * * * *

"Of primary importance, then, if a physician, institutional or practitioner, is to have any success in handling a case of opiate addiction-disease, is his attitude towards his patient—divesting himself of all conception of habit, appetite or vice as explanation of characteristic physical manifestations and symptomatology, and approaching the patient as a man with a definite disease requiring and deserving intelligent clinical handling. The patient will be the very first to mark a physician's shortcomings. If he has not confidence in the doctor's ability and understanding of his illness the doctor can help him but little. This statement applies not to addiction-disease alone but to every medical condition.

"There are three demonstrable elements to be determined, measured and controlled in the actual therapeutic handling of cases of narcotic addiction-disease. The first of these is the actual amount of drug which the patient's body demands to maintain functional and organic efficiency and to escape physical distress. The second of these is the extent of auto- and intestinal-intoxication, autotoxicosis and malnutrition. The third of these, which is both a result of and a causative element in the other two, is the extent of inhibition of function."

* * * * *

"In the successful handling of a case of addiction-disease, therefore, the first effort should be to determine approximately the amount of the patient's minimum daily physical need for the drug of his addiction. This need is clinically recognizable and definitely measurable."

* * * * *

"In the estimation of this amount of physical need the procedure is very simple. Have administered to the patient who is manifesting the symptomatology of drug-need, sufficient drug to remove the symptoms and restore him to complete physical, functional and nerve balance. Have the length of time observed which elapses before the symptoms of drug need reappear. Have this repeated several times and information is secured as to what quantity of opiate under the existing conditions will hold that patient in drug-balance for a known length of time. In this way can be mathematically estimated the extent of physical drug-need. The average need for twenty-four hours can be easily computed from the data obtained. It is merely a matter of arithmetic."

* * * * *

"It is therefore much wiser to direct immediate efforts to the securing and maintaining of health, reaction and tone—irrespective of the amount of drug required—until there is time and opportunity for the undertaking of competent withdrawal—a stage of handling and treatment concerning whose physical and clinical phenomena and manifestations and dangers too few are educated to and familiar with."

* * * * *

"I have briefly referred to the elements of intestinal and autointoxication and autotoxicosis. Intestinal and autointoxication, combined with worry, fear, and anxiety, constitute very important causative and controlling factors in whatever mental and physical deterioration has taken place in a case of narcotic-drug-addiction-disease. Physical, mental and moral deterioration are to a very small extent direct results of narcotic drug action *per se*. As long as a narcotic drug addict is maintained non-toxic, uninhibited and unworried, he is practically at his individual normal, plus an added physical need."

* * * * *

"The control of auto- and intestinal intoxication in narcotic addiction is as a rule of easy accomplishment if the patient is uninhibited and in functional balance and is not over-supplied or under-supplied with the drug of his addiction. The narcotic addict who is non-toxic and in drug balance and is not harassed by worry or fear needs practically no more drastic methods of elimination than his non-addicted brother. If he is over-dosed his elimination is inhibited; if he is under-dosed his eliminative powers are not capable of response. The element in the securing of evacuation of the bowel in a drug case, as well as in a toxic case of whatever description, is sluggish peristalsis; in other words, it is inhibition of nervous impulse. It is therefore not necessary to load a bowel up with large amounts of drastic and irritating cathartics. Indeed this procedure is very harmful and abortive of ultimate results. An over-irritated intestinal tract is not a good eliminative organ. To my mind the so-called 'typical stool' of the so-called 'Towns Treatment' with its content of jelly mucus has no clinical significance other than its evidence of a production of an exhaustive and irritative mucous colitis and means that however much purging may be accomplished competent elimination from the colon is at an end. Its appearance in a case under my care I should regard as evidence of injudicious treatment. For the bowel elimination of a case of narcotic-addiction there is needed practically nothing beyond the ordinary mild and non-irritating catharsis. All that is needed is to remember that if inhibition of peristalsis has not as yet been overcome, you may be wise to administer, about the time you should get an evacuation, strychnine or other peristaltic stimulators in sufficient amounts to overcome existing inhibition and stimulate peristalsis."

* * * * *

"I do not use or endorse a 'belladonna' treatment, a 'hyoscine' treatment, nor any other description of specific or routine treatment in addiction-disease. I regard the drugs of the belladonna and hyoscyamus groups, pilocarpine, etc., as extremely dangerous drugs to be routinely or carelessly used in the treatment of addiction-disease. They are rendered safe only after personal experience and study into their action and appreciation of the factors and influences which control their action in the functional, toxic, and narcotic drug conditions. The routine and unintelligent use of the products of these groups of drugs in the treatment of narcotic addiction—under the mistaken impression that they somehow or other have direct curative action upon the disease condition—has been the cause of a considerable mortality and an easily understood opposition among intelligent addicts. Hyoscine or scopolamine and the other members of this group, eserine, pilocarpine, the coal tar products, etc., are at times useful drugs to meet indications in the treatment of a case of addiction. Increasing intelligence in the handling of the addiction mechanism itself, however, renders the necessity of their use less and less frequent and the dosage of them required for therapeutic action smaller and smaller. They should simply be classed as of use among other things, peristaltic and circulatory stimulation and support, indicated eliminants, kindness and consideration, understanding and intelligence or any of the other therapeutic weapons in our possession.

"Elimination and the securing of it in the narcotic addicted has been referred to in this chapter. The chapter should not be closed however, without a word of warning against the excessive purgation with drastic and over-irritating agents employed by some in this condition. Drastic purgation is not at all synonymous with competent elimination. Competent elimination is not to be measured in terms of bowel-movements; but in terms of clinical symptomatology of toxemia, circulation and measure of functional efficiency. Excessive purgation means over-irritation and over-stimulation of eliminative mechanism, results in the interference with and exhaustion of function and defeats true elimination.

"Presence of good circulatory tone and absence of congestion in the eliminative organs is to me one of the most important factors in true elimination. The addict who is in good functional tone, has competent circulation, is in narcotic drug balance, and is non-inhibited, needs no more drastic eliminative measures than belong to ordinary rational therapeutics in the non-addicted.

"As to final withdrawal of the drug, and ultimate arrest of the disease, I shall say but little in this book."

* * * * *

"An element in successful withdrawal of narcotic must also remain, as in everything else, the inherent personal gifts and qualifications of the individual operator. A man works best with the tools most adapted to his hand, and operators of different temperaments and of different experience and training will always disagree on points of procedure and technique. My own procedure in final withdrawal is determined largely by my study and measure of my patient and my patient's reactions, addiction and otherwise, during my preliminary or preparatory work, selecting the time for final withdrawal of drug by consideration of similar factors as would be taken into account in an operation of election.

"After a preliminary stage, or stage of preparation, in which I have gotten rid of all possible abnormalities, physical and psychical, with my patient robust and reactive, confident and expectantly happy, with autointoxication, and inhibition removed and the possible residues of opiate or opiate product no longer stored in atonic body cells—the addiction-mechanism, therefore, only kept in activity by the current intake of opiate, which if properly handled and the patient not subjected to exhausting strain and struggle and suffering, can be eliminated in a very short time,—with these conditions consummated, I hasten elimination, keeping well away from exhausting purgation, maintaining my patient's circulatory and other functions, and conducting as rapid a withdrawal as is compatible with my patient's reactive condition and the reactions of his disease.

"In other words, I endeavor by my conduct of the case to reverse the process of development of the physical addiction-disease with its concomitants and complications, as I find it in the individual case, arresting the addiction-disease mechanism only after I have cleared the clinical picture in so far as possible of all other considerations."

J. McIver and G. E. Price—1916.[46]

McIver and Price made a study of the comparative values of various treatments as follows:

1. The original Lambert method.
2. Lambert's method without the belladonna prescription.
3. Lambert's method without free purgation.
4. Gradual withdrawal.
5. Gradual withdrawal with free purgation.

The following are the results of their study.

They selected several patients for comparison, of approximately the same age and daily dose, whose use of the drug covered about the same length of time.

They conclude as follows:

"1. The original Lambert treatment was more satisfactory than the ordinary, gradual withdrawal.

"2. The Lambert method without the free purgation (using ordinary purgation) was very unsatisfactory, patients suffering intensely and showing a marked tendency to delirium.

"3. The belladonna prescription was the least important element in the Lambert treatment, having little or no greater value than other sedatives, besides having a tendency in certain cases to produce delirium.

"4. Having a fixed dosage for each patient, as in Lambert's treatment, is an undesirable feature, which does not allow for individual differences; to disturb a patient every hour of the day and night is folly; and to try to blend him to a machine treatment is a very unwise procedure.

"5. The best method proved to be gradual withdrawal with free purgation as in the Lambert treatment, and sedatives or stimulants as required in the individual case.

"Patients using daily very large doses of drugs and over long periods of time can only have the drug withdrawn very gradually, without intense suffering or danger of collapse."

* * * * *

"The most valuable unit in the Lambert treatment is the method of free purgation. The Lambert treatment, while better than the old method of very slowly withdrawing the drug, is not as satisfactory as gradual withdrawal combined with free purgation and medication to meet the individual requirements.

"Any treatment which does not take into consideration the presence of the antitoxic substance in the body long after the drug has been withdrawn, and provide time, is almost certain to be void of permanent results."

---

[46] McIver, J. and G. E. Price—Drug Addiction—Analysis of 147 cases at the Philadelphia General Hospital. Jour. Amer. Med. Assn. Feb. 12, 1916—Vol 66. pp. 476-480.

C. E. Sceleth—1916.[47]

The following is an abstract of the treatment described by Sceleth which he states he used in fifteen hundred cases. It is suitable also, he states, for use in the patient's home by the general practitioner.

Treatment is based on following formula:

Scopolamin Hydrobromid	gr. 1/100
Pilocarpin Hydrobromid	gr. 1/12
Ethyl-morphin hydrochlorid (dionin)	gr. 1/2
Fluid extract cascara sagrada	m. 15
Alcohol	m. 35
Water qs. ad.	ʒ 1

Patients using more than 10 grs. of morphin a day are given 60 minims of the mixture every 3 hrs. for six days, the dose is reduced to 30 minims on the seventh day and on the ninth day to 15 minims three times a day only.

Users of more than 5 grs. are started with 45 minims which is reduced on the seventh day in a manner analogous to that just detailed; while to those who have been taking less than 5 grs. is given an initial dose of 30 minims only.

Scopolamin delirium develops in about four per cent of the cases and if it does the scopolamin should be omitted for a few doses and added again in smaller doses as the condition improves. He states:

> "The greatest danger, however, collapse, does not arise from the scopolamin mixture *per se,* but incidental to the withdrawal of the morphin. The tendency to collapse is undoubtedly favored by the presence of two drugs which act on the vagus—scopolamin, which is vago-inhibitory, and pilocarpin, which is vagotropic. If the pulse falls below 40 or goes above 120 per minute, the mixture is stopped and the patient is given the only drug which can offset the collapse, namely, morphin itself. The latter is injected in one-third grain doses every fifteen minutes until results are obtained. Patients in collapse, should not be given too large doses of morphin, or its derivatives, after treatment has been in progress for several days, as the dose to which the addict has been accustomed is likely to be overwhelming. The vomiting and insomnia which occur more or less constantly are not due to the scopolamin mixture, but occur with any treatment, and accordingly are not to be looked on as special complication."

* * * * *

> "As regards the other steps in this mode of treatment, a few remarks will suffice. The patient on admission is put to bed, given three compound cathartic

---

[47] Sceleth, C. E.—A Rational Treatment of the Morphin Habit. Jour. Amer. Med. Assn. Mar. 18, 1916. Vol. 66. pp. 860-862.

pills, followed by a saline cathartic (Epsom salt), and at once started on the scopolamin mixture. During the first few days of the course the diet should be light and easily accessible, and liquids should be pushed; the patient should drink 3 pints or more of water a day. On the tenth day, at which time the mixture is discontinued, strychnin nitrate, one-thirtieth grain, is given for three doses; the following day the amount of strychnin is reduced to one-sixtieth grain, which is continued three times a day for a week.

"By the fifth day, as a rule, the patient's desire for morphin is gone. He then manifests a desire for a more substantial diet and begins to put on weight rapidly. When the mixture has been stopped, and the patient's strength permits, graded exercises, in the open as possible, are instituted with the purpose not only of improving his physical condition but of allowing him to acquire a bodily fatigue, which is recognized by all as the best antidote to the insomnia—the abstinence symptom most likely to persist and the most difficult to conquer. A warm bath of 110 F. for ten minutes, or a neutral bath of from 94 to 98 F. for twenty minutes, will often relieve restlessness and insomnia. Carbonated waters are very gratefully received."

F. X. Dercum—1917.[48]

Dercum recommends complete rest with special feeding, bathing, massage, and electricity. He states:

"The question of the rate of withdrawal is not susceptible of a routine answer, but must be decided with special reference to all the circumstances in each individual case. Some writers advise immediate withdrawal, others rapid withdrawal, and others again very gradual withdrawal. Thus, Gilles de la Tourette advises sudden withdrawal if the patient has been taking large doses, say five to six grains daily, and gradual withdrawal if the patient has been taking less than five grains; while Comby advises sudden withdrawal invariably. It is my own practice not to begin withdrawal until rest treatment is fully under way. We must remember that the morphin habitué labors under an excessive fear lest the drug be withdrawn too soon. Besides, sudden withdrawal always implies a period of frightful physical and mental suffering. Further, the patient is, as a rule, intensely distrustful. I know of no class of patients with whom it is more difficult to establish friendly relations, or in whom it is more difficult to inspire confidence. However, if the patient learns after his first days of rest and isolation that he is still receiving his hypodermic injections, or that he is still being allowed his usual quantity of laudanum or opium, confidence sooner or later asserts itself, especially as the physical comfort resulting from the bathing, massage, and proper diet soon becomes pronounced. Withdrawal may then be commenced, and it is almost always best conducted very gradually. At first, the diminution of the dose is practically imperceptible; later on the reduction may be more rapid. If the patient has been in the habit of receiving hypodermic injections, it is my practice not only to reduce the dose gradually in the manner indicated, but also to begin adding to the injection small doses of strychnin nitrate, say one-fiftieth of a grain (1.2 milligrams), and if the skin be very moist, small doses of atropin sulphate, say one two-hundredth of a grain (0.6 to 0.3 milligram). These drugs markedly allay the nervousness and suffering of the patient. It is needless to say that after the morphin has been discontinued entirely, hypodermic injections of strychnin or of strychnin and atropin may be kept up for some time without informing the patient of the change. Cocain should never be used; a large number of patients that come under our care for the morphin habit have already acquired the cocain habit. The same remarks apply to the use of alcohol. Many of our cases, indeed, are instances of the 'triple' habit, namely, morphin, cocain, and alcohol.

---

[48] Dercum, F. X.—Rest, Suggestion, and other Therapeutic Measures in Nervous and Mental Diseases. Second edition. 1917.

"The reason for withdrawing the drug in the gradual manner I have described, is not only to diminish the suffering of the patient, but also to prevent the onset of serious symptoms. Every now and then, if the drug be abruptly withdrawn, signs of collapse—diarrhoea, sweating, cardiac weakness, and dyspnoea, with excessive prostration—may set in. In other cases, again, mental symptoms resembling those of confusional insanity make their appearance, the patient becoming hallucinatory, delusional, and finally delirious. Such symptoms are not likely to make their appearance if the drug be withdrawn in the manner indicated and under fully established rest conditions."

* * * * *

"The detailed method of diminution depends largely upon the individual case. As a rule, I continue for a number of days the quantity of morphin that the patient is habitually taking; I then begin to diminish the doses given in the early part of the day; those given at night are continued in full quantity for a somewhat longer period. This is contrary to the practice of others, who begin by diminishing the evening doses. I have observed, however, that cutting off the evening doses makes the patient restless and sleepless; while the reduction of the morning doses, though producing restlessness, is not attended by the great disadvantage resulting from insomnia and its attendant evils. No hard-and-fast rule can, however, be said to apply. The patient should be given the drug when he needs it most, and it should be first diminished or withdrawn at those periods when he needs it least. Inasmuch as morphin injected hypodermically is eliminated by the stomach and is subsequently reabsorbed by the intestines, Hitzig has suggested that in treating morphinism we should systematically wash out the stomach. This seems to me an unnecessary precaution. The procedure adds greatly to the distress from which the patient is already suffering, and it is doubtful whether the quantity of morphin thus gotten rid of is really large."

Walter A. Bastedo—1918.[49]

"Treatment.—I. Isolation from friends and hirelings.

"2. Gradual withdrawal of the drug in from two or three days to a week. Accompanying the withdrawal there may be diarrhoea, cramps in abdomen, back, and legs, intense restlessness, mental and physical suffering, and collapse.

---

[49] Bastedo, Walter A.—Materia Medica: Pharmacology: Therapeutics Prescription Writing. 1918.

Valenti has shown that the withdrawal symptoms in dogs are arterial hypotension and arrhythmia, and that the serum after withdrawal will produce the same condition in normal dogs. Talmey attributes some of the withdrawal symptoms to acidosis, and reports a case developing coma from this cause. Stokes finds a sympathicotonic state.

"3. The substitution for a time of other drugs, of which great favorites are atropine, hyoscine, dionine, and codeine. Keeping the patient in a state of partial narcosis for several days tends to prevent the discomforts which cause the craving for morphia.

"4. Nourishing food, to the extent of overfeeding.

"5. Massage, baths, and general measures to improve the hygienic conditions of living.

"6. Excessive and persistent purgation.

"7. Removal of the original cause of the habit, as by operation on an ovary or other source of pain.

"In morphinism there is no hereditary neuropathic tendency as there is in alcoholism, and the causes of the continuance of the morphine habit is the distress of the withdrawal symptoms. The morphinist will often desire to give up the drug, but never does so of his own free will, because he cannot stand the physical suffering. Yet morphine patients have a greater desire to reform than alcoholics have, and, when once reformed, are quite likely to remain so, unless the pain or worry, etc., which was the original cause of the habit, recurs. Often they go back to the drug for relief from suffering, rather than because of any special craving for it."

* * * * *

"The cutting off of the habitual dose because of some intercurrent illness, such as pneumonia, causes needless suffering and danger."

The author also gives Lambert's method in some detail and mentions briefly Stoke's and Pettey's, concluding as follows:

"It would seem that to obtain a cure as much depends upon the physician in charge as upon any method."

S. E. Jelliffe and W. A. White—1919.[50]

"The treatment is usually the prompt removal of the large doses. These can be readily withdrawn until the patient is reduced to the actual necessary amount of drug to get through the day comfortably with, which is about two grains. From this point on withdrawal should be gradual, carefully looking after the symptoms of abstinence as they appear. These symptoms refer particularly to the heart, the nervous system, and the gastro-intestinal system.. Sometimes profound collapse may occur with the withdrawal of the drug. Cardiac conditions should be watched and stimulants administered if there is any sign of weakness. For the diarrhoea opium should be avoided if possible. Acute with-

---

[50] Jelliffe, S. E. and White, W. A.—Diseases of the Nervous System. 1919.

> drawal and treatment by atropine for the sympathetic collapse, and pilocarpine or eserine, for autonomic stimulation, may be practiced to advantage."

In a separate work White [51] recommends Dercum's method.

T. F. Joyce—1920.[52]

The following is a description of the treatment carried on at the Riverside Hospital, North Brothers Island, New York, by Joyce under the New York City Health Department.

The patient first is placed in "preparatory" ward where in six days he is brought down to the smallest amount of narcotic that will hold him without the usual signs of drug deprivation—usually two to three grains in twenty-four hours. During this period of six days' reduction full catharsis is secured but no drastic purgation. Joyce states:

> "At six o'clock on the morning of the seventh day the patients are given a large dose of castor oil followed shortly afterwards by a small dose of morphine, the last they receive in the institution unless otherwise indicated. About four hours later the first signs of drug deprivation are usually experienced. This is a signal to start using a therapeutic anesthetic. At Riverside Hospital we use the hyoscine hydrobromate. I may say here that we use hyoscine internally practically with the same object in view that the general anesthetist employs ether, in other words, as these various symptoms reappear, small but adequate doses of hyoscine are given at irregular intervals, depending upon the physiological action in the particular case. Personally I find hyoscine, when used with reasonable care and in small doses, and particularly after thorough and satisfactory elimination a perfectly safe therapeutic agent, wonderfully adapted to this stage of the treatment. During this period, which we have termed the period of therapeutic anesthesia, we are combating all the phenomena attending narcotic deprivation, such as vomiting, general restlessness, intestinal colic, cramps in the legs, and a rapid, feeble pulse. These characteristic symptoms are held in check by the frequent administration of small doses of hyoscine, usually hypodermically. At the end of thirty-six hours, under favorable conditions the hyoscine is discontinued and we arrive at the period of convalescence."

During the hyoscin period no food is given but abundance of alkaline waters. Some cases require 9 to 10 doses of 1/300 gr. hyoscin, others 13 or 14 doses of 1/250 gr. Cocain users often become maniacal and go into convulsions. At this stage a single dose of morphin will counteract these symptoms. The author continues:

---

[51] White, W. A.—Outlines of Psychiatry. 6th ed. 1918.

[52] Joyce, Thomas F.—The Treatment of Drug Addiction. New York Med. Jour. Aug. 14, 1920. Vol. 112. p. 220-222.

> "At this stage of the treatment we produce what might be properly termed a modified twilight sleep. After thirty-six to forty-eight hours of withdrawal treatment the patients are found to be moderately intoxicated by the accumulative action of hyoscine; even after a period of twelve hours they experience all the customary signs of their intoxication and we describe this period as the posthyoscine hysteria. This is followed in twelve hours by a general feeling of depression and weakness which lasts from two to seven days, depending upon the recuperative powers of the individual and the duration of the addiction. During this early convalescent period they are given hot baths and mild hypnotics, if indicated, and a restricted diet."

Forty-eight hours after the last dose of hyoscin the majority of patients go to the "first convalescent" ward or if not quite ready to the infirmary. The latter are termed "laggards."

After a week or ten days in the first convalescent ward they are transferred to the "second convalescent" ward. Here their physical reconstruction begins. They have light gymnastic exercises and "occupational therapy." Joyce says the chronic user is lazy and it is necessary to teach him to work.

Joyce states that as yet he has found nothing that will remove the psychic trauma that the prolonged use of drugs inflicts.

J. Biberfeld—1921.[53]

Biberfeld reports on an attempt experimentally to detoxicate morphinized dogs. The author bases his experiments on the hypothesis that tolerance is due to an alteration in the nerve cells rendering them no longer sensitive to the action of the drug. As a result of experiments in which he sought to restore the normal sensitiveness of the cell, he found that the administration of albumen and a venesection caused a return of sensitiveness to the morphin, but this lasted, however, only a short time.

As to the significance of these findings in the treatment of morphinism, the author states:

> "As indicated, the action in the positive experiments was not permanent; in individual experiments it was still apparent on the 2nd day and very slightly so on the 3rd day, but it was principally exhausted on the first succeeding day and the insusceptibility to the alkaloid returned again. This is naturally of especial significance in relation to morphinism in man, which, although not identical, still is comparable with the state of insusceptibility. Nevertheless I think that an investigation should be made on this point, since both agents found

---

[53] Biberfeld, J.—Entwöhnungsversuche. Biochem. Ztschr. 1921. Vol. 122. p. 260-268.

to be effective—venesection and albumen injection—are quite safe. With this it would be hoped that at least it would help the patient through the first day of treatment with its difficult abstinence symptoms."

M. Roget Dupouy—1922-1924.[54] [54a]

The author disagrees with those who advocate abrupt withdrawal as he thinks it predisposes to relapse and the memory of the suffering endured prevents such cases from again seeking treatment, preferring even suicide to a repetition of the treatment. It must not be forgotten, he states, that the constitutional morphinomaniac is afraid of pain and that suicide during painful treatment is not uncommon. He also points out the difficulty of practicing this method except when the patient can be confined, as in custodial institutions, as voluntary cases will leave rather than stand suffering.

Not only for these reasons but also from a purely medical point of view he prefers the slow reduction method. The minimum of pain as compared with the method of Levinstein, leads to a more rapid convalescence and assures the physician of the patient's entire confidence. A case so treated will in the event of relapse or even in threatened relapse seek his physician's help. This situation is a true prophylaxis and the importance of such an influence over these cases should not be lost sight of. Real cure in these cases is a psychotherapeutic cure.

Rapid withdrawal, he claims, even though less rapid than advised by Erlenmeyer, gives rise, in old patients or when there is liver or kidney insufficiency, to symptoms of mental confusion with delirious dream states and hallucinations, not observed in gradual withdrawal, with profuse diarrhoea and severe neuritic leg pains.

Abrupt withdrawal with or without drastic purgations or sedative substitutes such as belladonna, xanthoxylin, hyoscyamus, cannabis indica, etc., is too severe to be warranted and convalescence in cases whose nervous systems and eliminative organs have been so severely shocked is longer and more difficult than when treatment is carried out without severe pain or violent crisis, but such treatment requires several months.

---

[54] Dupouy, M. Roget—Quelques réflexions sur la morphinomanie. Annales Médico-Psychologiques. 1922. p. 453-466.

[54a] Dupouy, R.—Traitement de la morphinomanie. Bull. Med. Oct. 25, 1924. Vol. 38. pp. 1193-1197.

In a later article Dupouy includes in his handling of treatment, withdrawal of the drug, detoxication, conduct of convalescence, and prevention of recurrence. In a brief review of the better known methods of treatment he characterizes abrupt suppression (Levinstein's method) as possible only in exceptional cases of vigorous and robust subjects, stating that he rejects it as dangerous and extremely painful. The "American way," of which he takes the Lambert method as typical, rapid suppression with active purgative and substitution, he states is brutal and difficult to bear and not free from danger. He presents, as his choice, slow withdrawal with diminishing doses of morphin over a period of at least three weeks, a modification of Joffroy's psychotherapeutic method.

His method in detail is given in the following extract:

"A. The basal principle is that the subject should remain constantly in ignorance of the dose of morphin injected. Knowledge on this point, especially when the dose reaches a minimum, two or three centigrams, almost inevitably causes an emotional reaction, anxious apprehension, painful neuropathic manifestations, insomnia, etc., while absolute ignorance of the dose favors our measures of encouragement and psychotherapy. Thus we have been led to continue the injections several days after complete withdrawal, making use in subjects who have reached zero of serum injections, pure or containing spartein, with the same technique as in injecting morphin.

"The day zero is reached is a particularly delicate period in the treatment: we hold it indispensable that it be not known to the patient, so that he may be spared every superfluous reaction of an emotional nature. This emotional influence is sometimes so strong that it is apparent in demorphinized subjects many days after their serum injections have been suddenly stopped without their having knowledge of what was contained in the solution, or rather of what was no longer contained in it. They imagine their last centigram of morphin is being withheld, they are apprehensive, they become distressed and suffer pain.

"B. A second principle is rigorous observance on both sides of regularity of injection. I habitually give four injections a day after always taking the pulse; in the morning between seven and eight o'clock, about midday, about seven o'clock, and in the evening between nine and ten. I give one injection before breakfast and one before dinner, for these encourage the patient to eat. Without morphin there is anorexia, sometimes even a feeling of nausea in the presence of food. The contentment that morphin affords overcomes spasm and disgust. Advantage should then be taken of this quiet if not happy moment to ingest nutriment.

"The hours agreed upon and all explanations made and all reasons assigned once for all, these should be strictly respected by both doctor and patient. If it has been agreed that the first injection should be given at quarter before eight o'clock in the morning and the second at quarter to twelve, the physician will stoutly refuse, whatever may be the entreaties of the patient on this score, to anticipate the moment of injection. But in return he ought to appear at the hour and the minute agreed on with his patient, with all the paraphernalia, syringe, vials, etc.

"We should realize in fact that the morphinomaniac in a condition of need awaits anxiously the instant for the injection which is to ease his suffering. And we should help to relieve this anxiety by inspiring him with absolute confidence in us, in our word, in our solicitude on his behalf. We ought not then under any pretext to increase his suspense and especially to abate the satisfaction afforded him by simply watching the clock, many times consulted during the hour that precedes our coming. Twenty-five minutes more, fifteen minutes more, three minutes more to wait! The certainty of our scrupulous exactitude on the part of the morphinomaniac is an element far from negligible in our psychotherapeutic treatment.

"C. The third principle is to ignore nothing in the psychology of the morphinomaniac. Never to lose sight of the fact that he is, in the great majority of cases, asthenic (if his moral energy was normal, he would not find himself obliged to come into our hands, he would effect his own withdrawal), algophobic (if he did not dread suffering, he would not have resorted to morphin), a toxicomaniac, that is to say one obsessed by the drug, passionately devoted to all the poisons that stupefy and excite the nervous system, adding cocain to his opium or disguising it with hashish, alcohol, or ether, and in this quality of toxicomaniac sympathizing with all like him and always ready to convey to them surreptitiously or to accept from them the little packet of white powder; in fine, constitutionally unbalanced, his moral sense diseased, emotional and imaginative."

* * * * *

"D. Now a few details of technique of some importance, which I have learned through experience with these patients, disturbed over everything and most of all by a drop escaped from an ampoule, from the syringe, or from their skin, and trying instinctively to learn the strength of the solution or the dose they are receiving. Do not use ampoules, which cannot be manipulated as desired in the view of the patient, but vials prepared in advance, from which the dose shall be drawn directly in such manner that the injection shall always be carried out in the same way and shall always contain the same amount of two centicubes (excepting, of course, where your addict will allow you at the outset to give him three, four, or five centicubes or even more).

"*Seat of injection.* Do not give injections in the abdomen or in the arm or in the anterior or anteroexternal aspect of the thorax: the patient watches all you do to him, and if the syringe slips or if you have the misfortune to spill, to "lose" a drop of the precious fluid, there will be jeremiads and recriminations which you must know how to escape. Have your patient lie face downward or in a three quarter position in such a way that you can puncture him at leisure in sound skin in the superoexternal aspect of the buttock or in the lumbar region without his seeing anything.

"A preliminary touch with tincture of iodin, a pledget of cotton under the needle to catch the drop which may be squeezed from a defective joint that it may not fall on a skin thirsting for this occurrence, finally a wiping afterward with an iodized tampon.

"*The solution.* This ought to be of adjustable strength since we recommend always to give when possible an injection of the same amount, one or two cubic centimetres. Hydrochlorate of morphin is dissolved in isotonic serum, filtered and sterilized. Joffroy used to add a little bitter quassia to prevent the patient from detecting by taste the strength of the solution injected, a drop of which he could procure by finding it left either at the neck of the vial, on the piston or needle of the syringe, or even near the site of injection, or perhaps by squeezing out a little of the injected fluid after the doctor was gone.

"*The needle.* It ought to be completely sterilized and acutely sharp. We prefer very fine and short needles (fifteen or twenty millimetres, according to the thickness of the skin). The syringe filled, the needle poised for stabbing, the skin held between two fingers without wrinkling, a slight stab quick and free, a slow pressure on the piston—all is over. The injection, performed by the physician himself as often as possible, should be above criticism.

"E. *The decrease.* Diminution of the dose begins from the day of undertaking treatment. Cocain can be totally suppressed at once without inconvenience when, either for the purpose of increasing the thrill of temporary exaltation, or simply to avoid encountering the mildly disagreeable sensation of local tension following every hypodermic injection, the patient is accustomed to add it to his morphin. Next may be dropped what Joffroy called the 'proportion of luxury' and we estimate as a quarter or a third of a medium dose (forty to sixty centigrams a day), half or two-thirds of a strong dose (a gram and more). One may proceed rapidly in the early days and suppress very easily three-fourths of the initial dose."

* * * * *

"According to the initial dosage, we decrease each day or each injection five centigrams, four, three, two, one, a half, or a quarter of a centigram. Do not decrease uniformly the dose of the four injections in one day, which should be equal at the beginning of the treatment. Diminish the first more rapidly and the third more in correspondence with its successor than the second or especially the fourth. Beginning with two or three centigrams, the dose will decrease only for one or two injections a day, leaving the others at the same figure two or three days continuously, thus establishing transient levels, 'rest stations.' In this way we are able to replace first the morning injection, then that before dinner by an injection of serum (pure or sparteinized, according to the case).

"No serious occurrence ought to attend gradual demorphinization when so carried out, only a few unpleasant cramps in the feet and calves of the legs, a little acidity, difficulty in reading, in moving, in interesting oneself in a definite occupation, temporary disgust for food, finally a few bad nights, chiefly near the zero mark. These slight discomforts are not even universal, but I prefer to encounter them: with them I am more certain of attaining the end normally.

I distrust cures that are brilliantly successful, patients who laugh and sleep well; there is generally some deception that the patient risks paying for in the end with real suffering when, the store he concealed on arrival or received clandestinely being exhausted, he suddenly effects his own withdrawal. The pulse curve faithfully indicates the general condition and marks unimportant complications which may arise. It ought always to be taken, if not at each injection, at least morning and evening and at the same hour in the day."

The author prefers not to give hypnotic drugs for the insomnia, but when they are necessary recommends a mixture of one part of bromidia with three parts of veronidia, or the old bromide and chloride mixture with balneotherapy.

"G. *Cessation of injections.* After injecting isotonic serum for a few days, substituted for the morphin solution without anything said, the four injections may be withdrawn all at once, or they may be stopped in succession, one after the other. I generally follow the latter course. But I am not anxious to withdraw these injections. I wait until the patient himself tires of them, feels wearied, and begs me to stop. I am not troubled if they become a little painful when the serum contains spartein or pilocarpin: I prefer, in the interest of prophylactic psychotherapy, that the last recollection he has of injections should be frankly disagreeable to him, repulsive."

He decries the substitution of other opium products, such as heroin, dionin, pantopon, etc.

"II. DISINTOXICATION.

"The treatment of morphinomania does not consist in merely reducing the patient to zero, even with the precautions we have just indicated. It includes as well treatment of the anatomical and functional disturbances resulting from chronic intoxication of the organism.

"Morphin affects not only the nervous system, but also the liver, the heart, the kidneys (this is very evident in animals subjected experimentally to chronic opium intoxication). It is the reason for offering a number of rules to complete the therapeutic management of demorphinization.

"As much rest in bed as possible. Instead of constant confinement in bed, a *chaise longue* in the bedroom, or still better in the open air.

"Lactovegetarian alimentation. Plenty of milk and other fluids. Various infusions, particularly mint and linden-orange. Fresh eggs. Green vegetables and sharp salads. White cheese. Fruit sauces. Bananas. In some instances I have availed myself with great advantage of iced food, iced milk or chocolate, ice cream, natural ice.

"Frequent laxatives, which accomplish regular elimination of the morphin with which the organism, especially the liver, is saturated and avoid those sudden bilious attacks that are so extremely debilitating. Give every day or every second day a package of sulphate of sodium alone or with sulphate of magnesium, or else a half glass of laxative water, or a coffee spoonful of calcined magnesium or a Châtel-Guyon tablet in a little water. Hypodermic injections of sodium sulphate (morphin dissolved in sulphurized serum in the proportion of five or ten centigrams to the cubic centimetre) are very effective, but are painful and I have abandoned them.

"Assistance to hepatic function: cholagogues, boldin, hepatic extract.

"Cardiac support in morphinomaniacs who are aged or physically enfeebled or have particularly nervous hearts: camphorated oil, spartein; sodium bromide in case of erethism. An attempt has been made to establish it as a principle that each centigram of morphin withdrawn should be replaced by a centigram of spartein. I have tried this and abandoned it: it is useless and sometimes harmful. I give spartein at the conclusion of the treatment, five to twenty centigrams, when I see an indication for it."

Following the three weeks of reduction he recommends one week to complete the "secondary injections of serum" and a convalescence of four to six weeks with tonic and dietetic treatment.

As a prophylaxis against relapse he recommends the establishment of complete confidence in the physician, avoidance of the old environment, mental and moral re-education, and a willingness on the part of the physician constantly to be ready to aid the patient at times of weakness or depression when relapse is especially threatened.

C. C. Wholey—1922.[55]

Wholey gives the following description of the method of treatment followed at St. Francis Hospital, Pittsburgh, Pa.:

"The withdrawal period extends over a week to three weeks, at times longer in debilitated individuals, according to the physical and mental conditions presenting. We use morphine hypodermically, except in those who have never used the needle—at times even in these—given regularly before meals and at bed time with p. r. n. doses additional where there is much distress, for first few days, of one-third to one-fourth the regular dosage. It is almost never necessary to give more than gr. I. regular dose, regardless of amount being taken and usually less, with the free catharsis immediately established. We give the dose which meets the demands of fair degree of comfort and circulatory support and sleep for two to three days and then reduce according to unit of initial dose. If one grain in beginning, it is first reduced to two-thirds, then one-half, then one-third, one-fourth, one-sixth, one-eighth, one-twelfth, one-sixteenth, and at times one-twenty-fourth, then drop one or two doses daily, substituting therefor strychnin or water (patient is always kept in entire ignorance) until water is being given entirely. In some patients the water is continued for a week before they are told the truth. Compound cathartic and vegetable cathartic pills, blue mass—two compound cathartics morning and evening for the first few days with blue mass gr. X the first day—salines—enough of all to induce very free purgation the first four or five days and then less—Tr. Belladonna—Fl. Ext. Xanthoxylin—Fl. Ext. Hyoscyamus (Towns Mixture) is used routinely from the beginning, unless patient shows idiosyncrasy, to point of tolerance, fifteen to twenty drops, at times more, every two hours at first then decreased but continued during most of course. Nights are not disturbed if patient sleeps. Sulphanol, Trianol, Adalin, Bromides used as sedatives and hypnotics—fifteen to twenty grs. Trianol or Sulphanol or mixture of both at bed time, gradually reduced. Hydrotherapy after first few days, good food, etc. While the general medical care follows a pretty definite plan, it is departed from whenever indicated and is made to fit the patient's condition. One case had a marked idiosyncrasy for Belladonna. A careful substitution of hypnotics (paraldehyde being especially serviceable) was made. Strychnin has proven an excellent aid in debilitated or aged cases, as a substitute and adjunct. From the beginning of the treatment, an effort is made to establish the most friendly relation between doctor and patient and to establish mutual confidence. In keeping with the mental and social status of the patient, appeal is made in the particular way which seems best calculated to reach the type of individual being dealt with. In all of them they are made to understand that the problem is theirs and that merely being freed from the physical dependence on the drug is but a start in the solution of the successful breaking of the habit. The patient's situation in life and his particular problems are analyzed and wherever it is possible to point out any relationship between his habit and his particular situation in life, this is done. Appeal is made by pointing out the consequences of his habit to himself and to others; he is frightened where this is necessary by specifically mentioning the lunatic asylum—the poor-house, etc. As said above, the patient is given an understanding of the exact situation as far as this is possible in keeping with his ability to grasp the same. Patience and firmness are absolute requisites in treating these patients, on the part of those in charge. If the patient deceives or relapses, one offence is not sufficient cause for casting him off. Some of the most successful "cures" have been accomplished in those who have relapsed several times. The difficulty of the problems are pointed out and every effort is made to maintain the individual's self-respect and to prevent his being affected by the general attitude toward the whole class of addicts, indiscriminately designated as "dope fiends." Many cases are mentally defective and their condition can be seen from the beginning and time is not wasted in futile attempts at their regeneration, outside of the physical and medical requisites employed. The habit is often part of a psychoneurosis and this has to be taken up and treated just as one would remove a source of physical discomfort which is apt to occasion a return to the drug.

---

[55] From unpublished material supplied by Dr. Wholey.

"To re-state in general terms our method of handling these patients medically, I would say that for the majority of cases it is absolutely necessary to have them in closed wards, or conditions of supervision which render it impossible for them to procure the drug, or to discontinue the treatment under slight discomfort. The more intelligent patients, and those whose character has not suffered greatly, willingly co-operate in any such procedure. When patients are placed under these conditions knowingly, the fact of their being under strict guardianship in itself has a very beneficial effect. However, before instituting such steps as those just indicated, there is a frank statement of facts regarding conditions of treatment, and the patient's consent and co-operation obtained (this of course does not apply fully to certain individuals who are placed in an institution by police authorities, etc.).

"As far as the medical treatment applies merely to getting the patient off the drug, we look upon this, generally speaking as a rather simple problem. It is a matter largely of applying one's knowledge of general medicine to such cases of toxicity. The length of time varies as stated previously, with the physical and mental state of the patient. In a general way it is accomplished by the judicial use of thorough purgation, and a gradual reduction of the drug, securing sleep by the use of hypnotics, and insuring proper nutrition to the patient. Belladonna and hyoscyamus are excellent adjuvants for obtunding the distressful symptoms of withdrawal. The patient never leaves physically uncomfortable, nor having any physical craving for the drug, if we have been able to carry out our plan of treatment.

" . . . Of course, throughout the treatment we have already begun by suggestion and otherwise, our endeavor to effect a real cure by re-educating the patient and enabling him in every way possible to avoid future pitfalls. The real difficulty, of course, lies in the fact that during all the period of the use of the drug, the individual has established a distorted abnormal set of nervous and mental reflexes. Whenever his nervous system, by way of its sensory paths, is informed by aroused sensations of pain and discomfort of something being wrong in his organism, he has by use of the narcotic distorted this normal message into one which gives him exactly the opposite conviction of his condition; in other words, he is made to think that all is well, when the normal mechanisms of his body have endeavored in every way to enable him to know that something is wrong, and that the proper thing should be done about it. This reversal of normal sensations goes on for such a long period, and becomes so deeply established, with the inevitable breaking down of morale, that later on, even when he has been freed medically from the use of the drug, he is, under situations similar to those in which he has been in the habit of resorting to the drug, unable to resist the call of the deeply established perverted reflex. The ability to withstand this situation, of course, varies with the caliber and character of the individual, but for every individual who has perverted his instinctive reflex activities to the extent above indicated, there is a point at which he practically loses control and acts more or less automatically, and will take the drug if it can be procured.

"If the psychology of this situation could be understood more generally, our whole attitude and method of handling narcotism would be changed, and individual cases would have much greater opportunity of rehabilitation, especially where the patients themselves are intelligent enough to grasp the meaning of the situation sufficiently to avoid conditions that deprive them of their decision, and will bring about their subsequent resort to the drug."

Sir W. H. Willcox—1923.[56]

"Sudden Withdrawal.

"Where the general health of the patient is good and where the addiction is of short duration sudden withdrawal is advisable. I think the dangers of sudden withdrawal have been somewhat exaggerated, and in many cases the hesitation to cut off the drug without delay leads the patient to think that his cure is hopeless. It has been my experience that where the general condition of the patient is good and there is every facility for careful nursing, sudden or very rapid withdrawal may be safely effected and is the most satisfactory method.

"In confirmation of this view I may quote the results of the experience of medical officers of prisons in this country which have been kindly given me by Sir Malcolm Delevingne. It is a frequent occurrence for drug addicts to be sentenced to terms of imprisonment, and the invariable rule with regard to them has been sudden withdrawal of the drug. In no case have any alarming symptoms occurred and in only a very few isolated patients has any narcotic drug been given at all. In these cases on one or two occasions a very small dose of liquor morphina has been given by the mouth, but never has any narcotic drug been given hypodermically.

"Gradual Withdrawal.

"In cases of addiction of long duration, especially if the general physical condition is of low standard, gradual reduction is advisable. In cases of this type hyoscine has been advocated, a mild hyoscine delirium being produced for thirty-six to forty-eight hours by repeated small doses given hypodermically. At the end of this no morphine is given. The advantage of the hyoscine treatment is that in a long-standing case sudden withdrawal is effected. The disadvantage is that there is apt to be a more pronounced development of symptoms during the period of after-treatment. It is doubtful whether any ultimate advantage is gained from hyoscine treatment.

"After-treatment.

"After withdrawal has been effected the after-treatment is very important, and in this stage, in addition to general hygienic and medicinal methods, psychotherapeutic treatment is most valuable. The cultivation of the will power and of a feeling of hopefulness and certainty of recovery are most important factors for success in this phase of the treatment."

O. Wuth—1924.[57]

This author points out that routine methods of treatment should be avoided as each case should be treated individually, but states that in general he found very little success in the use of bromides and narcotics including chloral and scopolamin. He prefers the antipyrin group. He further refers to promising results obtained by Klee and Grossman in the use of cholin by injection, which he believes supports his hypothesis as to the mechanism of the withdrawal symptoms.

---

[56] Willcox, Sir W. H.—Norman Kerr Memorial Lecture on Drug Addiction. British Med. J. Dec. 1, 1923. No. 3283. pp. 1013-1018.

[57] Wuth, O.—Ueber Morphinismus. II. Bemerkungen zur Therapie. München. med. Wchnschr. July 4, 1924. Vol. 71. pp. 893-894.

E. Meyer—1924.[58]

This author prefers abrupt withdrawal in the treatment of morphinism, stating that by freeing the patient from the drug as quickly as possible a maximum of time for the psychiatric treatment and physical rehabilitation is allowed. After naming the commonly observed physical withdrawal symptoms, he states:

> "In general all of these symptoms need not develop to an alarming degree, if the proper attention is given them, especially in regard to the heart disturbances. The psychotic symptoms show marked psychogenic characteristics, sometimes actively demonstrative. In general we can say that the so-called abstinence symptoms, at least the psychotic ones, are psychopathic reactions. Their danger is greatly exaggerated, with great harm to the patient, and exists according to our experience in the mind of the patient himself and unfortunately in that of many physicians."

After reviewing the drug therapy involved, the author continues:

> "If we look back over the course of treatment we recall a sullen, annoying, unreasonable resistance on the part of the patient and a thousand objections to withdrawal. Generally after 3–4 days, sometimes sooner, along with a sense of physical well-being, there appears an understanding of the measures used by the physician and often an exaggerated gratitude and desire to proceed with the treatment. A few days later the picture changes again. The patient loses his original understanding of the situation . . . and often shows no control or tact in regard to his many different desires and complaints. If he succeeds in getting through this stage, which may last days or weeks . . . generally, except in the case of a very degenerate individual, there will result renewed understanding, active argument as to the desirability of cure, and a reasonable assurance of success. It is desirable then in general to keep the patient, as long as possible, under treatment, which is necessary to increase his understanding and will-power. The patient is still sleeping badly and perhaps he must undergo periods of uneasiness. In addition to understanding and cooperation the patient must also be enjoying for a long time the best possible sleep and an even, quiet disposition before release. The longer release can be delayed, the greater the gain. Transition to freedom should be a very gradual process. . .
>
> "In view of the danger of relapse arrangements should be made with the

---

[58] Meyer, E.—Ueber Morphinismus, Kokainismus und den Missbrauch anderer Narkotika. Med. Klinik. 1924. Vol. 20. pp. 403-407.

patient or his family for an early re-examination. At first he should report within 3 months, then, after 6 months, etc. and remain at the clinic for a few days in order to assure control conditions. These observations should be made in the same strict manner as the withdrawal treatment in order to establish his complete freedom from the use of narcotics. Our results in this regard are very limited for we have observed that often even in the most extreme abuse of the drug withdrawal produced no noteworthy disturbances, that the injury of the reaction and the contraction of pupils are not regular symptoms, so that such an examination prolonged over even a number of days need not reveal a renewed used of the drug. It should be noted that perhaps the urinalysis according to Loofs could make possible for us a clinical-chemical control of morphinism or perhaps still further confirmation is needed, according to the findings of Leake, who found certain changes lasting 10 hours and longer brought about by morphin in the blood. . . .

"Our experience shows that the highest aim of treatment is and will remain prevention; conscientious care in the administration of morphin and prohibition of the possession of needles by the patient. Moreover, the prescribing of morphin solution, such as is still considered proper for insomnia, unrest, and general, nervous conditions, is anything but harmless and should be avoided, the more so because there are other substitutes for his purpose. . . .

"In this connection the question may be raised as to how long morphin may be administered regularly in the treatment of severe, chronic painful conditions. In my opinion this may be done only where death is certain in a short time and then only when there is no substitute. To such a degree must the chronic abuse of morphin be considered harmful."

M. Mignard—1924.[58a]

In his article dealing with the psychology and psychotherapy of drug addicts, the author defines such cases as "individuals who habitually seek certain states of intoxication induced by exogenous substances generally taken in doses which do not immediately endanger life but may induce various kinds of euphoria or analgesia." It follows that there are individuals who are habitually—or will be—under the influence of the drug. The psychology is a mixed one—that of the intoxicated individual and that of the addict himself—really an indivisible whole. In his handling of his theme, however, he confines himself for the most part to the characteristics peculiar to the addict, such a habit, passionate craving for the drug, and the perversion of the instincts though recognizing that the episodes of intoxication are a part of the vicious circle.

He distinguishes two types of drug addicts—addicts by occasion and addicts by disposition. The former, he states, are those whose previous state of mind does not render them especially liable to drug addiction, but a special occasion, such as their having been given the drug while under treatment, starts a habit. In their case the habit precedes the perversion of the instincts and for a long time dominates the scene. Their passion for the poison is consequently less fundamental and less irrational; there is left, however, some element of resistance on which the psychotherapist may lean.

[58a] Mignard, M.—Psychologie et psychothérapie des Toxicomanes. Bulletin Médical. 1924. Vol. 38. pp. 1190-1203.

"Frequently, the addict by occasion would like to shake off the yoke; almost always he is unable to do it unaided. From the point of view of his defects he seems to be without will-power rather than without morals, whether it be that a primitive defect of will favors the development of the unlucky habit on occasion, or that a secondary impairment of will results from the development of the habit aided by the effect of the drug."

The addict by disposition, the author states,

". . . was entirely prepared by his natural disposition or by a psychological state which had been developing for a long time under the influence of circumstances, to seek in habitual intoxication the false appeasement or deceptive solace —the dulling of consciousness, at all events—which his discordant inclinations demand. Very often he has himself gone after his drug, or if the occasion came unsought, it merely awakened in him his natural inclination towards a sort of slow euthanasia, which, as we shall see, is at the root of the drug addict's mentality.

"The psychology of the addict by disposition is, therefore, essentially marked by the primitive character of the perversion of the instincts. The latter develops into drug addiction, but almost always it has already manifested itself in many other ways. Want of morality is here the rule and begins to display itself early. The effects of habit are only secondary, as well as those of impaired will-power; and for a long time the pervert plays with them. He is a dilettante of addiction as also, very frequently and simultaneously, of lying, stealing, abnormal erotism. He is rarely a man of a single drug, but very often the fickle, and yet assiduous, lover of many drugs. He delights in dignifying his ill-omened inclinations by means of a false varnish of art, science, or philosophy."

He continues as follows:

"From the psychological point of view, therefore, *drug addiction* is a *morbid habit,* an *abnormal passion,* a *perversion of the instincts.* The *morbid drug habit,* like all habits, springs from the repetition of an act in the past and tends to its repetition in the future. Through the repetition, organic automatisms are established, which facilitate the execution of an action already performed several times and thus lure on the desire—at first physical and then mental—to repeat the action. So long as mental spontaneity remains mistress of habits, as happens, notably, in the case of habits directed towards an end which is voluntarily prosecuted, the established automatisms are merely excellent tools in the service of thought. But if the psychic organism, far from directing habit, allows itself to be carried away by it, the organized automatisms exercise an increasing sway over mental spontaneity, reversing the normal exchange of influence between these two orders of activity. In this manner there develops a state of mental subduction tending to result in a morbid mentality, as we have shown in other articles. But in the case of the drug addict, the power of habit, generally tyrannical enough, finds itself reenforced by adjuvant factors of the greatest importance.

"*The weakening of the will, the clouding of the intelligence, the blunting of the higher forms of sensibility,* are, especially in the long run, among these adjuvant factors. They depend, no doubt, less on the psychology of the addict than on that of the intoxicated individual. But the two psychologies are, as we have said, inseparable. These phenomena of mental degradation become in time preponderant. They end by constituting the principal obstacle to the suppression of a habit which rapidly becomes irresistible.

"This habit is all the more irresistible because it is associated with a *morbid passional condition.* This passional condition is constituted in the beginning by the immoderate desire for toxic euphoria, whether this euphoria results from a passing exaltation, as in alcoholic drunkenness, or from an agreeable torpor, as in opium-smoking, or finally, from the disappearance of suffering, as in therapeutic morphinization. But soon the signs are inverted. The intoxicated individual no longer enjoys the intoxication, but suffers terribly if he is deprived of his toxicant. Not only the nervous system, but the entire organism unfortunately has become accustomed to the poison, which has become a sort of paradoxical nourishment. This nourishment slowly kills, but the lack of it begets a tyrannical craving. The psychic organism feels its influence by experiencing a distressing anguish soon complicated by an intolerable anxiety. The craving, once established, manifests itself in violent form at each attempt to break off the habit; more than that, it demands a fatal continuance. Like all passional states, the passion for drugs brings about an emotional subduction. It *directs the mind of the patient exclusively to the realization of its desire.* It absorbs gradually all his other inclinations, all his other sentiments, turning them from their course before destroying them for its own advantage. This is the perversion of the instincts which we shall discuss immediately. But it disturbs the intelligence by first *exciting the imagination* in the direction of the euphoria which is being sought, and then *warping the judgment* for its own justification. Gradually, it *substitutes* itself for the will, the primitive or secondary atrophy which we have already mentioned. In the end it reduces the patient to veritable slavery.

"The *perversion of the instincts,* as we have said, may be primitive and anterior to the drug habits; but if it was not pre-existent to them, it always develops, if they last long enough, as their consequence. This results, as we have just shown, from the fact that the passion for the drug gradually replaces those systems of inclinations which constitute the instincts, beginning with the highest, the most disinterested ones, and ending with the lowest, those which affect the maintenance of the vegetative life itself. At the beginning, drug addiction deflects, to its own profit, the superior orientations of the mental life, gradually substituting itself for them. Religion, philosophy, arts, sciences, social instinct, are at first exploited for the profit of the habitual intoxication before being completely abandoned for it. This is the period of supposed drug-inspiration. It has been justly said that certain great poets were such in spite of their addiction and not because of it. It might be added that their works, fine though they were, would have been more sound without the addiction. Soon, moreover, the flame, colored for a moment by these artificial hues, grows low, flickers, and dies. This is the period when the addict's negligence, laziness, want of morals, become fixed —simple results of the substitution of morbid inclinations, sentiments, and activity, for normal inclinations, sentiments, and activities. . . . .

"Other perversions are developed in defense of the principal one. The drug addict becomes a liar—and sometimes an extremely ingenious one, especially in the matter of obtaining his favorite drug. Just as readily he becomes a thief. Some, no doubt, do not even hesitate to kill, particularly if the nature of the intoxication inclines them to violence, as is evident among alcohol drinkers, cocain-sniffers, and—more rare in our climates—hashish eaters (whence the word *assassin* is said to be derived).

"Finally, the drug addict sacrifices to his evil idol not only his superior unselfish instincts, but also those which affect the preservation of his miserable existence. He no longer seeks anything beyond stupor, complete forgetfulness, the drug-induced Nirvana in which, he knows, his life will founder shortly after his intelligence. From the very beginning, moreover, his morbid passion had death for its goal. Logre is quite right when, from this point of view, he compares the mentality of the drug addict with that of the melancholiac, for in both, the perverted instincts turn toward destruction. The drug addict, in particular, is first and foremost a lazy person, who prefers *euthanasia* to patient effort towards the good which is characteristic of a normal existence. Whether he assumes the deceptive appearance of a heedless optimist or that of a hopeless pessimist, the drug addict is always the more or less conscious disciple of an integral nihilism. That is the beginning and the end of his psychology."

In what follows the author outlines in considerable detail the basis and the essential mechanics of the psychopathic treatment he advocates.

"The psychotherapy of the drug addict proceeds very naturally from the psychology we have just sketched. It will not be necessary, therefore, to give a systematic exposition of it; it will suffice to draw its main lines, corresponding to the different stages of the cure.

"a. The *withdrawal period* is one of the most important and, at the same time, most distressing stages of the psychotherapeutic treatment. It calls, almost always, for *a certain degree of coercion,* because it is an attempt at *breaking,* more or less abruptly, a vicious *habit.*

"Now, it is exceptional for the subject to be able to impose on himself and maintain by himself the discontinuance of addiction practices in the environment which permitted their birth or their development. Nevertheless, I have witnessed the complete and absolutely voluntary discontinuance of a habit of drinking alcoholic *'apéritifs'* twice a day, in consequence of the appearance of disquieting symptoms, a habit of many years' standing, at that. I likewise have found it possible to cure a woman who was addicted to morphin and was very eager to be cured, without subjecting her to restraint—by a rather slow method, to be sure. But these are exceptional cases. It may be accepted as a principle that the psychotherapy of the withdrawal period calls for the breaking of the habit by means of *comparative isolation,* under conditions which do not permit the resumption of the use of the drug either openly or surreptitiously. In fact, in the present state of our legislation, such a cure almost always requires internment, and is, therefore, not generally possible except on the occasion of an episode in which ordinary psychopathy has become pronounced mental alienation. For even when the drug addict wants to be cured, he is not likely to be able to do it without entrusting to others the task of blocking his stratagems, sometimes despite his future rebellion. Herein lies the beneficence of the legal dispositions in certain countries, which for this purpose and under certain guarantees, permit the voluntary abdication of freedom.

"We shall not dwell on the difficulties of the withdrawal, on the *firmness,* on the ingenuity of the *surveillance,* which must be opposed to the ruses of the drug addict, to his violence, to his attempts at exciting pity, to his use of all the means at his disposal for obtaining the poison of which he is being deprived, more especially as he is plunged into a state of deep anxiety by the condition of abstinence. We shall merely repeat that the isolation need only be relative, and that advantage should be taken of the need for surveillance to assist the patient morally. This *moral assistance* is indispensable; it should be at once *sedative* and *tonic* and extremely *patient.* Without yielding on any essential point, insisting all the while most firmly on the suppression or the progressive diminution, as may be indicated, of the use of the drug, one must be able to quiet the patient, encourage him constantly, and give him the *comfort* of active *sympathy,* sovereign requirement for so many asthenics and persons suffering from anxiety.

"This moral medication against despair and discouragement, applied steadily and skilfully, may bring the best results.

"Advantage should be taken of the patient's temporary confusion and of the confidence inspired in him by a good psychotherapist for the purpose of investigating the particular causes of his addiction. Without being exactly psychoanalytical, these investigations might nevertheless be of considerable service.

"The *psychological disclosure* of the ideoemotional systems associated with the recollections of the origin of the vicious habit are sometimes of the greatest importance. To cast full light on the validity of the pretexts invoked, to seek the real causes behind them, is to teach the patient to know himself better and, in consequence, to direct himself better; it is to destroy a number of false ideas, hidden adjuvants of the favorite vice; it is to give more force to clear consciousness and to reduce the force of the subconscious and of its morbid influence; it is to combat the fear of phantoms by showing their inanity. By all these methods and by various mild distractions, which should be administered very discreetly, the spontaneous attention of the patient will be *diverted.*

"One should try to turn it patiently, gradually, from its one direction and transfer it to other objects. Thus the second period of the psychotherapeutic cure will be ushered in.

"b. *Reeducation period.* The directive principle of this period might be stated as follows: Only that is destroyed which is replaced by something else. But it is not another poison that should replace the one withdrawn. While developing his bad habit, the addict had gradually discarded normal activities; the progressive resumption of these activities is a good means of setting aside the vicious automatisms in their turn.

"As a matter of course, *work* is going to have a very important—the central place, if you like—in this resumption of activity. Is not the overcoming of indolence the destruction of one of the deepest mental roots of drug addiction? The work chosen must be work adapted to the means, the tastes, the condition of the patient at the time. In the way of *manual labor,* work in the field or garden generally gives good results for men, household duties for women. But it is important that the work should be agreeably presented and that its resumption should be progressive. It should also be sufficiently varied. It must be interrupted by diversions. In short, manual work alone will not suffice. Every man has intellectual needs which turn towards evil if they are not directed towards the good. Every manual laborer should receive a certain amount of intellectual culture. But *intellectual* and *artistic occupations* and *distractions* should be chosen even more carefully. In this line, a very small thing may cause great good or great harm. One should try to instruct without boring, to divert without demoralizing—above all, to incite the interest and the taste to a personal search for the beautiful, the good, and the true, so that in the future the attraction of the evil habits might be displaced by the attraction of these. But this brings us to the third and last point which we must develop.

"Before doing that, however, we ought to mention that it is also advisable to give physical exercise to intellectual workers. Too narrow specialization is bad mental hygiène, and advantage may be taken of the withdrawal cure for remedying this fault. *Sports,* in moderation, may render great service.

"c. *Consolidation period.* The addict, having been thus weaned and reeducated, still remains very weak from the moral point of view. He has got rid of the bad habit; he has resumed good ones. But where will he find the strength to resist future temptations? What beneficent sentiment will he be able to oppose to the germination of evil passions, one of which had already led him astray? Only the sublimation of his inclination, enlightened by intelligence, will supply him with this triumphant dynamism.

"Appeal can be made, and undoubtedly should be made, to all the normal inclinations for the purpose of barring the road to an eventual offensive return of the passion for drugs. Reasonable anxiety regarding the preservation of his health, provided it does not turn to hypochondria, may, as we have illustrated, play a decisive rôle in the cure of an addict. But selfish, egoistic inclinations and sentiments, relating to the individual organism directly, rarely suffice to keep the individual from being attracted to the poison, since the attraction has precisely the character of inverting the sign of these inclinations and of transforming them into destructive instincts. Whoever seeks only physical satisfaction may prefer drug-induced torpor, even if fatal, to the trials among which a normal human existence strenuously pursues its happiness, and especially its spiritual happiness.

"*Emotional response to family and society* is a much greater help. In the laboring circles of Paris, where the sentiments of the ex-alcohol addict are very often better than his reason, I have seen several cases of repentance firmly established—after an adequate withdrawal cure—through sincere pity for wife and children. Professional honor, the desire to be a useful human being instead of a pernicious shred—these may be very serviceable in the consolidation. One must know how to cultivate all these sentiments in the addict after the withdrawal, and for this purpose contact with him should not be lost too quickly; it will be well to see him occasionally for a long time after the apparent cure.

"The disinterested search for philosophic and scientific truth, the noble contemplation of art, are excellent ways of sublimation for him who can attain them. Finally, a sincere and active faith in the real significance of the highest ideal—that is the crowning point of a truly complete cure. That he may no longer run the risk of injuring others, that he may destroy his former demoralizing scepticism forever, the ex-addict must have a deep faith in the essential worth of the good.

"In one sense, every cure of drug addiction, which is serious enough to have lasting results, implies a complete new birth of mental trends, and is thus equivalent to a sort of conversion."

C. Römer—1925.[58b]

After reviewing the more recently advocated methods of withdrawal from the drug, Römer emphasizes the role of the family physician, both in preventing morphinism in the first place and in the prevention of relapse after treatment. He states:

"The withdrawal cure must be followed by a *period of consolidation,* which should last as long as possible—several months, if at all convenient; this period should likewise be spent in the institution under medical supervision, but with increasing personal freedom, and should be utilized for *observing and influencing the total personality.* Unfortunately, this period is seldom observed. The patients hurry out of the institution; they overestimate their power of resistance altogether too much and even their relatives, for obvious reasons, are more willing to listen to the extravagant talk of the patient than to the warnings of the physician.

"It is very difficult to get an idea of the *duration* of the results obtained in the institution. Many patients are lost sight of; as to others, the report comes that they soon relapsed; only a few—those whose circumstances are especially favorable—probably have lasting results to record. Most of my patients already had on record more or less frequent relapses before entering my institution, and I assume that the next relapse was not long in coming despite a successfully accomplished cure. My inquiries in open and closed institutions met with pretty much similar answers.

[58b] Römer, C.—Die Behandlung des Morphinismus. Klin. Wochenschr. 1925. Vol. 4. No. 8. pp. 364-66.

"The *prognosis of morphinism* is, consequently, *not* to be characterized *as favorable.* A good share of the blame surely lies in the defects of legislation. Stricter official supervision of the traffic in morphin and its substitutes has been demanded by physicians often enough, but always in vain. Quite recently, a special attempt was made by John to direct the attention of the government and all the officers and organizations concerned to the inadequacy of the present condition. Bolten reports that the comparatively small number of morphinists in Holland is to be referred to the rigorous legislation. Nevertheless, until we can count on aid from the law in Germany—which I, too, consider important—it is the duty of physicians to take in hand *unaided* the fight against morphinism, as well as it may be done."

* * * * *

"It is always a question of especially constituted people who belong to the large group of *psychopaths.* Some painful organic disease, or experiences which permitted the development of neurotic symptoms, may furnish the occasion for resorting erroneously to morphin. There cannot be too much emphasis on the advice that morphin should be used as sparingly as possible with nervous people, *that it is better not to use it at all, on principle,* no matter how passionately these patients may plead their sufferings as reason. One can manage just as well with other more harmless remedies, as *luminalnatrium,* hyoscin, paraldehyde, etc., often even by means of mere suggestion, such as the moment may inspire. *Beware of morphin in bronchial or nervous asthma!*

"The nerve specialist must try day by day to make clear to his patients the origin of psychogenic complaints, and he knows the difficulty of this task, for the layman takes the standpoint that, if he feels a pain somewhere in his body, there must be some organic lesion there. As a result of this firm conviction, the patient permits the removal of appendix, ovary, etc., as the case may be, or a plaster cast or other things of the sort to be put on, or—*he becomes a morphinist. . . .*"

* * * * *

"It is not possible, within the limits of a short discussion, to cast any more light on the road travelled by such a patient until he finally became inexorably a victim of morphinism. Generally he has wandered from doctor to doctor without revealing his true nature and without the knowledge of his family physician, if he has one. Secrecy is compulsory in these trips. *But if a physician has perceived that someone is using morphin without a valid reason, he should leave no means untried to bring that person as early as possible to a withdrawal cure, which should be combined, at all events,* with a causal psychic treatment; cf. Römer: *Beiträge zur Behandlung der Psychoneurosen. Klin. Wochenschr.* Vol. 3, Nr. 9. 1924.

"Naturally, exception should be made for those patients who have arrived at the use of morphin by reason of incurable, painful, or distressing organic disease. Nevertheless, even in such diseases, when they last for decades, as tabes, there should be warning against beginning to administer morphin too soon.

"It is a source of great injury to many families that the family physician is growing more and more rare—through increasing specialization, on the one hand, and lack of time, on the other. And yet, a family physician would be so emphatically desirable, particularly for the timely recognition and diagnosis of nervous functional disorders. Well acquainted with the peculiarity of his patients, he can be their best adviser. Furthermore, in consultation with colleagues, he can give the latter knowledge of important particulars. This is all the more important for the reason that words cannot be chosen too carefully, because a nervous individual listens with anxious, yet frequently well-concealed attention to every word of the physician. If, for example, he is told that there is no disease in his organs *now,* but that there had been *at some previous time*—were it only very light apical catarrh, or very slight myocardiac weakness, or that the X-ray picture indicates that years ago there had been a gastric ulcer—such a statement may become the starting-point of severe neurotic complaints and hypochondriac depression, which drag on for years, are unusually difficult to banish, and may possibly lead to morphinism; cf. Bumke, O.: *Der Arzt als Urheber seelischer Störungen. Dtsch. med. Wochenschr.,* 51 Jg., Nr. 1. 1925. If traces of former diseases are discovered in a nervous individual, the findings should be kept from him so long as there is no occasion for treatment.

"It would be highly desirable, therefore, if the good old custom could be revived again, whereby every family had its house or family physician, whose manifold duties no specialist can undertake and whose opinion would be of weight in all decisions affecting the well- or ill-being of individual members of the family. The present-day physician, who—in contrast to earlier times—is already trained in psychology at the university, will surely attain the same or even better results than the respected family physician of earlier times, if he connects his psychological studies with his general medical knowledge and grounds them in the rapidly increasing experience due to his intimate relations with land and people. *In his hand lies the prophylaxis against many nervous and psychic lesions, which are often slow of development—and prophylaxis against morphinism belongs in this class.* Probably, too, the relapses to such morbid conditions might thus be obviated."

Erich David—1925.[58c]

After reviewing the relative merits of cholin, luminal, veronal, medinal, etc., in the treatment of the withdrawal symptoms, the author calls attention to the problem involved in relapses as follows:

"There is one problem, however, which in my opinion has thus far been handled very inadequately. Everybody knows that the patient is not yet cured when the stage of acute abstinence symptoms has been passed, but rather that the important stage of convalescence has but just begun. As to how long the latter stage lasts we read and hear the most varied opinions. According to one, six weeks suffice—the body-weight has by now attained its peak; hence, regulated activity is now the only correct procedure. Someone else takes the view that while convalescence has generally been achieved after six weeks, institutional care for as long a period as possible, and constant, most careful supervision, are still absolutely required. And so we find in literature such varying estimates as 6 weeks, a quarter, a half, and even one year.

[58c] David, Erich.—Ueber die Ursachen der so häufigen Rückfälligkeit nach der Morphiumentwöhnung. Zeitschr. f. d. g. Neurol. u. Psychiat. 1925. Vol. 99. pp. 475-484.

"*A priori* we should believe that it would be easy to prove by means of statistics which view is the correct one, since we should only have to determine whether more relapses were to be recorded among those cases which had been under observation for only 6 weeks than among those which had been under medical supervision for one-half to one year. Statistics, however, indicate nothing of the sort. Rather, it is well established that there is unfortunately as great a percentage of relapses after one-half or one year as after 6 weeks. This unfortunate result must, I thought, surely have a cause, and for this reason I determined to follow up this problem, especially as in the literature there are frequent statements to the effect that observation for as long a time as possible after the withdrawal is absolutely necessary, but nowhere could I find any penetrative statements as to the cause of the very high percentage of relapses. *A priori* it was, of course, clear to me that a convalescence of 6 weeks could not suffice, for while the patient is now physically quite fit, psychically he is not yet ready to withstand all the fluctuations of life without morphin. For example, he is at this time not yet ready to do regular and concentrated mental work. The days seem endless, but he has not yet the energy to busy himself with work. As a matter of course, the recollection of his former great capacity and the oppression of his complete lack of energy seduce him now to a relapse.

"But if the patient remains longer than 6 weeks under strict medical control, he grows slowly also psychically more resistant; his energy increases and he is gradually enabled to concentrate and to do regular mental work. This happens in almost all cases after about four to five months, and therefore I was always of the opinion that that was the time to discharge the patient and let him stand on his own feet. The experience of another, unfortunately, taught me otherwise. I saw again and again that half a year or even a year of the strictest control did not altogether exclude a relapse, even when the economic situation was of the best—I am speaking, of course, only of patients who were possessed of the firm determination to remain free. Consequently, the latter factor cannot by itself be decisive in solving this problem."

The author then gives in the patient's own words an account of the circumstances leading up to his relapse after treatment and observation in an institution for nine months. He apparently considers the case typical of a large group and continues his analysis of the causes of relapse and concludes as follows:

"And so a man who had had institutional care for three quarters of a year, and who had completely regained both capacity and desire for work, had a relapse a few days after his discharge. First of all we see that unfavorable external or economic conditions may, no doubt, frequently help to bring about a relapse, but that they by no means play a decisive part. Other factors, apparently, are also in the cast. The first to be considered are a certain exhaustion and languor without the possibility for external reasons, of rest and recuperation. In addition—and this is perhaps the most essential—there is the feeling of ennui. Time refuses to pass; hours seem endless; the patient feels lonely; suddenly there comes the recollection of the time when he used to take morphin. Then he was never bored; he felt well; he was never tired and weary; time just flew. To be sure, he also sees at once the great dangers which might be consequent upon his use of morphin. An inner contest takes place; on the one hand, inhibition is still too strong; on the other, he consoles himself with the thought that just one injection would surely not lead to immediate addiction —he will look out for that. But this inner conflict is followed in most cases—and that is the worst feature—by a certain restlessness, anxiety, and finally, perhaps, by trembling, and outbreak of sweat. This condition always resolves the inner conflict in favor of morphin. In other respects it is surely one of the finest arrangements of nature, that all pain is very quickly forgotten—much more quickly than pleasure. But for the patient newly withdrawn from morphin, this law of nature is certainly not a blessing. Quite the contrary! Generally it is fatal for him. The benefits derived seem to him much greater than they really were; longingly he thinks of the glorious time when he soared through life, half-lost in dreams, building fantastic air-castles. But the infinite dangers, and particularly the torments he endured, are underestimated.

"From the above we see first of all that even after three-quarters to one year of strictest control, although physically and psychically capacity and desire for work have been completely restored, we cannot yet speak of a cure of morphinism. One might assume, to be sure that a patient who has had ample experience in his own body of the dangers in the use of morphin, would be forever immune. But, as we have seen, such is not the case. Furthermore, that a cure has not yet been achieved is evident from the fact that patients who have abstained for one year bear the first injection magnificently; they experience a euphoria and feel themselves physically and mentally much more capable. Yet, according to their own accounts when they took morphin for the first time in their life, they could not bear it at all; they felt miserable and began to vomit. A further proof of the fact that we may not yet speak of a cure even after a year, we find in the circumstances that the patients under consideration could in a very short time attain to such large doses—in the case related above, 0.3 after eight days; yet at the beginning of their trouble, they could not have borne them without most severe manifestations of poisoning.

"The latter fact, especially—that patients, after three quarters to one year interruption, could immediately bear an injection of rather high percentage (0.03-0.04) experienced a euphoria and felt possessed of greater capacity, whereas after their first application of morphin, they felt ill, became dizzy, and vomited; and furthermore, that despite the long pause, they were so resistant to morphin that they could increase the daily dose with such great rapidity; that some of them, according to their accounts, even had to do it and considerably more quickly than at the beginning of their addiction (as has already been said, such rapid increase would be absolutely impossible for a person who never in his life had taken morphin without most severe manifestations of poisoning),—is surely absolute proof that certain permanent alterations have been made with reference to morphin; in no other way could we explain this resistance. Just what these alterations are is as yet a mystery. But we shall not go wrong if we assume that the deeper grounds for the high percentage of relapses after morphin cures are to be sought also in these resistance-producing alterations.

"And so, just as we strive nowadays to explain the general picture of a psychic disease by taking into consideration not only the congenital factor, but also the disposition, some particular experience, the environment, the effect of the endocrines, of infections, and of exhaustion, we must suppose that a number of factors cooperate in bringing about the relapse to morphinism. And finally, it is also evident from the above conclusions that among the causes of a relapse, along with external influences, such as a particular experience, environment, and exhaustion, there is also an inner factor, which is most likely conditioned not only by the personality make-up and constitution, but also by ductless gland and cell changes.

"Theoretically one might picture the situation somewhat as follows: after addiction, the morphin combines with some cell component; after withdrawal there is no substitute for this combination; there is, therefore, a vacancy and a consequent longing, lasting for a long time, for a reunion with morphin; hence that craving for morphin which is naturally particularly strong in the first days, when the vegetative regulating center in the mid-brain is completely out of balance. But even in the first weeks and months after the withdrawal, during which the vegetative nervous system tries to regain its equilibrium, this craving can probably not be completely inhibited so long as energy is below par and capacity and desire for work have not yet been completely restored. The craving persists and undeniably brings about a relapse in almost all cases. It is quite otherwise, however, in the instances we have presented above—in which abstinence has gone on for perhaps a year. In those cases, the vegetative nervous system, and consequently, body and mind, have so far regained their balance, that capacity and desire for work are completely restored. The craving for morphin, therefore, has gradually been so inhibited and replaced by other interests, that it is generally imperceptible. The entire psychophysical organism has regained its balance and suppressed the craving for morphin. But woe, if on some occasion the latter rises to the surface of consciousness at a time when, because of general over-exertion and ennui, it is impossible to divert it by means of other interests. Then there is a reunion of all the factors which, as we have seen above, play the leading part in a relapse; the vegetative system is thrown out of balance while the craving for morphin begins its assault with the heavy artillery of restlessness, anxiety, trembling, sweating, etc., until the tormented body pays the required tribute.

"Somewhat after this fashion we shall have to explain physiologically and psychologically the causes of the exceedingly high tendency to relapse after a morphin cure.

"It has not yet been possible for me to become acquainted with patients who have relapsed after an interruption of more than a year. Therefore, we can only say that within a year after the withdrawal a final cure cannot yet be assumed, but that after an interruption of a year there still persist in the body such alterations as together with external factors explain the high percentage of relapses. Whether the situation changes after a number of years, I have no knowledge. At all events, the prognosis of morphinism presents a very poor picture.

"Since we now know the more immediate causes of relapsing, it is perhaps quite proper to draw a few conclusions therefrom.

"First, we shall have to answer the question as to how long the patient must be kept under strict medical control, and when it is time to discharge him and set him on his own feet. Statements in the literature, as we have already mentioned, vary so tremendously. As we have seen, after six weeks the patient is generally physically well, but he still feels the lack of the stimulation furnished him thus far by morphin. The days seem endless, but he has not yet the energy to busy himself with work. He has not yet regained completely the capacity and desire for work, and just because of that, he will inevitably be seduced to a relapse by the recollection of his former greater capacity and the oppression of his complete lack of energy. That he is not yet mentally recovered, we can easily prove by giving him some easy scientific book to read and asking him to give a report on it after a few days. The patient will not yet be capable of doing that. If it is at all possible for him to read the book through intelligently, it will take him weeks and weeks to finish his task.

"This lack of stimulation, however, passes after several months, and I am willing to say that after four to five months every withdrawn individual has completely recovered capacity and desire for work. If he is then assigned the task just mentioned, he will perform it very quickly with utmost satisfaction. This test seems to me the most infallible indication as to whether the time for discharging him has arrived. To retain him any longer in an institution, just because it is true that physical alterations with reference to morphin still exist, would be absolutely senseless, since we have seen that the same phenomena are present even after a year. The prognosis is unfortunately very inauspicious. Someone will, of course, retort: if a complete cure is not to be assumed after a year, the only conclusion to be drawn is that internment for a longer period is absolutely required, if complete success is to be achieved. That is true enough, but first, a patient will hardly submit to that in view of the present-day difficult economic conditions, and secondly, who knows whether the physical alterations with reference to morphin will disappear even after a series of years?

"From the purely scientific standpoint, therefore, we shall have to answer the question as to how long strict supervision is absolutely required for a morphin cure by saying that a complete cure cannot be attained even after a year, but that after four to five months capacity and desire for work have been completely regained, and that this moment seems the most proper for permitting the patient to resume his vocation.

"If, unfortunately, it is not yet possible to remove beforehand the inner factors which play so important a part in bringing about a relapse, nevertheless the above conclusions teach us something else of great importance,—namely, that physical fatigue or mental lassitude, especially when associated with ennui, constitutes the greatest danger for an individual who, having been withdrawn from the use of morphin, is again freely following his vocation. It must be thoroughly impressed upon the patient before his discharge that diversions, such as concerts, the theatre, moving pictures, or any other pleasures, are of utmost importance for him, and that he must indulge in those to the utmost extent. It is highly appropriate to arrange, if possible, a program every day and to carry it out, so that every hour is filled with some activity or diversion. Naturally, the program must be so arranged that overexcitement and overwork are excluded. The best course is for the patient, after four to five months of strictest supervision, to take up his regular work and at the same time get all the diversion possible. Above everything, the patient must avoid being alone, and for this purpose it would, naturally, be most appropriate that he should constantly have about him a dependable, energetic person, acquainted with the patient's particular nature.

"A closer observation of the personality of those who fall victims to morphin discloses that they are mostly individuals who have been born with an unstable vegetative nervous system, and hence, are frequently quite inadequate to the demand life makes upon them. They are always persons who must be ranged in the large group of psychopaths. And therefore, it is of utmost importance, during the entire period of withdrawal, to deal with them psychotherapeutically, and to educate and develop in quite pedagogic fashion the personality of the individual. But even after the discharge, it is absolutely necessary to keep in contact with the patient and to concentrate all effort on the development of his individuality and personality. Unfortunately, this almost never happens. And yet, this therapeutic procedure is probably of extreme importance. For, as we have seen, the internal factors play as essential a part in causing a relapse as the external factors. And even though we cannot remove all internal factors, it would surely be a real step in advance to exclude at least one of them by educating and developing the personality. It might well be that thus a relapse would in many cases be precluded."

Ph. Klee and O. Grossman—1925.[59]

These authors, in reporting on the therapeutic uses of cholin in a considerable number of conditions, point out that the withdrawal phenomena due to a disturbance of the vegetative nervous system can be controlled by the administration of cholin. They advise further studies of its use in this connection.

R. Krauss—1926.[60]

The author gives the history of a case of homosexuality during the course of which severe gastric pain and diarrhea developed, apparently from nervous causes. Codein and later morphin to the point of addiction were required to control these symptoms until in the course of psychotherapeutic treatment for the homosexuality, the symptoms disappeared spontaneously, not to return. The author utilizes this case to illustrate the importance, in cases of opium addiction, of determining and removing the psychogenic cause of the condition, as quoted in the following:

---

[59] Klee, Ph. and O. Grossman.—Ueber die klinische Brauchbarkeit des Cholins. Munch. med. Wchnschr. Feb. 13, 1925. Vol. 72. pp. 251-254.

[60] Krauss, R.—Morphinismus und Homosexualität. Ztschr. f. d. g. Neurologie u. Psychiatrie. Vol. 101. 1926. pp. 271-277.

> "The case we have presented is, finally, an obvious proof of the fact that all our efforts to cure morphin addicts—even those who are willing to be cured—are in the end without result, if we do not succeed in removing the psychogenic cause of the abuse of morphin, thereby effecting a change in the personality. For the purpose of these therapeutic efforts I have found Frank's method of treatment by far the best. I admit that in the handling of the various psychotherapeutic methods, the personal attitude may play an important part. So far as my attitude is concerned, there is decisive significance in the fact that in the Frank method of treatment the pathogenic material is drawn forth by the patient himself, and by him exclusively; that the patient himself separates what is essential for causing the disease from the non-essential; that the recognition of this essential part has direct 'compelling authority' for the patient; and that as compared with other methods of treatment, this method leads to final success in the same patient in a comparatively short time.
>
> "And finally, this method of treatment permits the person who is applying it to remain objective, so far as that is at all possible in psychotherapy. The transference to the director of the treatment is eliminated, as well as the necessity of subjective explanations and interpretations through the aid of symbols; in short, the rôle of the doctor remains that of the director of the treatment of a psychic disease in the same way as in the individual treatment of some physical disease."

Nerio Rojas and José C. Belbey—1926.[61]

These authors describe their use of adrenalin during demorphinization with consequent abatement of the withdrawal symptoms. They state that they refrain from discussing the "pathogenic and chemical interpretation" of the beneficial effects observed.

In three cases suffering from acute withdrawal symptoms they obtained uniformly beneficial results. In other cases (the number is not stated) they observed individual variations in the effect according to individual susceptibility to adrenalin. In some of them disagreeable effects were observed which led them to conjecture that a constitutionally neurovegetative factor might invalidate the method, sympathicotonic individuals giving poor results. In the vagotonic constitution the results were beneficial.

---

[61] Rojas, Nerio and Belbey, José C.—La Adrenalina en la Desmorfinizacion. Semana Medica. 1926. Vol. 33. Part 2. pp. 705-707.

They infer that half a centigram of adrenalin (1-1000) may replace any morphin injection of the day. The majority of the patients, they state, do not recognize the substitution.

In a few animal experiments in which rabbits and dogs were used they observed the lessening of the severity of withdrawal symptoms after twenty-four to forty-eight hours' abstinence in morphinized animals. They conclude their article as follows:

> "Collecting and correlating the facts obtained in our clinical experience, we assert that the initial diminution of morphin is easy, presenting no inconvenience. The real difficulty lies in the critical moment of zero and the next few days. We have experimented with many substances represented to alleviate the patient's sufferings in this situation, sodic luminal in large doses, bromides, prolonged baths, sulphate of berberine, whose enthusiastic proprietors recommended it, etc., without any result. The anxiety has always prevailed. Adrenalin alone, on the contrary, advocated by numerous authors as a cardiac tonic in case of necessity, has given us an excellent result as a substitute for morphin in the conditions already described."

T. M. Bógolow—1926.[62]

In an abstract, this author is quoted as having experimented with the use of oxygen subcutaneously in the treatment of narcotic addiction, and as having followed its employment in certain mental diseases, both in France and Russia. The abstract continues as follows:

> ". . . He observed the abatement of motor unrest, the return of sleep and appetite, gain in weight, increase in the hemoglobin and the number of red blood corpuscles, as well as the clearing up of complicated schizophrenia and the more rapid occurrence of convalescence. Subacute and chronic schizophrenics, encephalitics, katatonics are not affected. Furthermore, addicts, morphinists, etc., were treated, proceeding on the assumption that narcosis is related to a sort of asphyxia, which one endeavors to diminish in the case of surgical narcosis by a simultaneous administration of oxygen. The patients were: 12 morphinists, 1 heroinist, 2 opium eaters, 1 veronalist, 3 cocainists, 3 morphinist-cocainists, 5 alcoholics. The oxygen is best injected into the epigastrium or subcutaneously under the shoulder blade at the level of the eighth rib, for which the pressure in the bulb is sufficient. After the insufflation (200-280 ccm. ?) the patient must lie still for ¾ hour, so that the gas does not penetrate in large quantities into the throat or inguinal region, which causes pain. On the average, 5 or 6 insufflations are necessary, which are best given daily—since the effect lasts about 24 hours—although intervals of about two days can be made. Practically all the typical symptoms usually disappear after half an hour, the patient

---

[62] Bógolow, T. M.—Die Heilung von Narkomanen durch subkutane Zufuhr von Sauerstoff. Moscow Med. Journal, 1925, No. 10. Abstracted in München. med. Wchnschr., 1926. Vol. 73. p. 132.

becomes fresh and hopeful and asks for more oxygen. The personal reports of two physicians who were morphinists are full of enthusiasm for this method of cure. The insufflation of oxygen under the skin makes it possible to withdraw the narcotic immediately (only in 3 difficult cases was it impossible to withhold medication), so that the duration of treatment is considerably shortened. The very rapidly ensuing improvement even occasionally permits a continued ambulatory treatment. It is, therefore, a method obviously worthy of attention, one to which the patients gladly submit and which, up to the present, has given no bad results."

Alexander Lambert and Frederick Tilney—1926.[63]

The authors give an account of their experience with the use of a patented preparation—narcosan—in the treatment of drug addition. They state that narcosan "is a solution of lipoids, together with nonspecific proteins, and water soluble vitamines." The lipoids are said to be secured from soy beans and cotton seeds, the vitamines from plant seeds, the nonspecific proteins from alfalfa seeds or Hungarian millet—narcosan being a mixture of these ingredients. In this connection they give the following:

"The theory of the action of narcosan in the body is that narcotics, such as morphine, call forth in the body certain protective substances to neutralize them. If the narcotics be suddenly withdrawn, and not given, these neutralizing substances are themselves toxic to the body. The lipoids in narcosan neutralize these toxic substances in place of the narcotic.

"After seventy-two hours, because the withdrawal symptoms are over, these neutralizing reactions have ceased, the lipoids are then continued to replace the depleted lipoids in the body. The nonspecific proteins of the narcosan solution are added to stimulate the blood forming tissues. This is a theory which scientific investigations must prove or disprove.

"In this regard it is interesting to note that the work of van Leeuwen confirms the idea that the lipoids exert a definite influence on the action of alkaloids in the body. He has shown that cephalin augments the action of pilocarpine, while lecithin inhibits this action of cephalin on the pilocarpine.

"He has also proved that the serum of men and animals inhibits the action of cocaine, without destroying the cocaine, and has further shown that lecithin possesses the same inhibiting effect on the cocaine. In an interesting discussion, he holds that this effect is produced by a physical combination in the adsorption of the drug, and is not due, as many others believe, entirely to the destruction of the drug by the liver. Other workers have found that animal tissues render inert other alkaloids such as digitaline and strychnine.

"But the work of Greenfield and Pellini shows that up to the present time, though sedulously sought for by many investigators, these neutralizing or protective substances to morphine have not been proven to exist in the blood of human beings or animals tolerant to morphine. Nor was any toxic substance found present in the blood as a result of morphine habituation. The validity of a theory, however, of how narcosan acts is a question aside from its value and effectiveness as a remedy for narcotic addiction."

---

[63] Lambert, Alexander, and Tilney, Frederick.—The treatment of narcotic addiction by Narcosan. Medical Journal and Record. Dec. 15, 1926. Vol. CXXIV. No. 12. pp. 764-768.

They report on the results of this method of treatment in 219 men and 147 women, in which they produced "a successful withdrawal of the drug in a few days, in some instances with but little discomfort, and in all instances with less suffering than the ordinary withdrawal method." They continue:

"The patients sleep without hypnotics of any kind during and after their treatment, and at the end of a few days are hungry, and digest easily all that their renewed and voracious appetites cause them to take.

"The treatment is easily carried out with much less detail than with the belladonna treatment, and with no delirium as in the hyocine treatment, and leaves the patient free from depression, and, as must be emphasized, with a returned ability to sleep."

* * * * *

"All these patients previous to admission to the narcotic ward had had their baths, their thorough investigation as to whether or not they were concealing any narcotic on themselves. On admission to the ward they were given a capsule composed of:

Hydrargyri chloridi mitis	gr.i	gm. 0.06
Ext. Colocynthidis	gr.iii	gm. 0.18
Ext. Euonumin	gr.ss	gm. 0.06
Resinae Podophylli	gr.ss	gm. 0.03
Capsici	gr.ss	gm. 0.03
Pulv. zingib. Strychninae sulph. } aa	gr.1/60	gm. 0.001

"This was followed three or four hours later by a dose of epsom salts; as soon as their bowels acted they were given one c. c. of narcosan hypodermically. This was given intramuscularly, in the muscles of the upper arm, or in the shoulder at the back of the arm. These narcosan hypodermics are given thus every four hours for the first twenty-four hours, then every six hours for three days and nights, and then every twelve hours for three days and then once a day for about ten days, or until the patient has had about forty injections. No injections of morphine or heroine must be given. If these narcotics are given, intense distress, nausea and vomiting, headache, and a sense of benumbing collapse is produced. In fact, the administration of morphine or heroine can produce a serious collapse. If the patients succeed in smuggling in narcotics and take them, these symptoms soon are evident. The narcosan treatment is self-protective against the patient indulging on the sly in narcotics. If patients are nervously collapsed from the sudden withdrawal of their narcotic before treat-

> ment begins, they should be given narcosan immediately to quiet them, especially the women, who are more likely to become wildly hysterical under these circumstances. This quiets them and then they should have their cathartics."

The authors then discuss in some detail the symptoms evinced during the first days of treatment, appearing convinced that the patients sleep more, suffer less, and regain their appetites sooner than with other methods they have used, making a rapid convalescence.

In twenty-seven patients, divided into different groups, and selected at different periods in the course of treatment, examinations were made "to ascertain if variations in metabolism occurred in the body during the treatment" . . . . . the blood being tested for urea nitrogen, uric acid, creatinin, and sugar, and the amount of carbon dioxide combined with the plasma. Red and white cell counts and hemoglobin estimates and differential counts were made simultaneously, as were also urine analyses. The findings of these examinations are given in detail. The authors give no formal conclusions, but at the end of their article they state:

> "The question here investigated is purely a medical decision of the value of narcosan as a treatment for narcotic addiction. Narcosan is equally efficacious in the treatment of other narcotics, as alcohol and veronal."

A. Erlenmeyer—1926.[64]

The author has reviewed critically the earlier theories seeking to explain morphin tolerance and the withdrawal symptoms, including the work of Alt, Faust, Marmé, as well as the more recent ones of Cloetta, Legewie, Valenti and Hirschlaff, Fürer, Jastrowitz, Wuth and David. After briefly noting the salient points of the earlier writers, he continues in much greater detail a discussion of the more recent ones as follows:

> "The best explanation still seems to be the one given in 1883 by Professor Marmé, Göttingen. He gave hypodermic injections of quite large but not fatal doses of morphin to dogs for some time, and after putting the animals to death, he found in the organs of the lesser circulation *oxydimorphin,* which he succeeded in isolating. When he gave healthy dogs injections of this oxidation product of morphin in the form of the more soluble hydrochlorid, administering it in small, gradually repeated doses, the dogs developed *regularly symptoms of poisoning which resembled in every particular the abstinence symptoms caused by the withdrawal of morphin, and which vanished when he gave the dogs*

---

[64] Erlenmeyer, A.—Zur Theorie und Therapie des Morphinismus. Zeitschr. f. d. ges. Neurol. und Psychiatrie. 1926. Vol. 103. pp. 705-718.

injections of medium doses of a morphin salt. Because of their bearing on our later analysis of the behavior of heart and blood-pressure during the withdrawal period, I shall here give Marmé's findings pertinent thereto word for word. He found in these dogs: *'strong pulse acceleration without vagus paralysis, marked lowering of blood pressure with simultaneous dilation of the peripheral blood vessels, lowering of the body temperature and debility resembling collapse.'* From these he drew the conclusion that oxydimorphin is formed in the organism of morphinists as a result of the prolonged administration of morphin injections, *and that it begins to develop its toxic effect only when the morphin effect has abated or ceased altogether.*

"There is opposition to this hypothesis, too. Legewie objects that the oxydimorphin developed in the organism is again rendered ineffective by morphin 'in a (single) breath.' Here, it seems to me, there is a misunderstanding with reference to the time, for the mutual influencing of morphin and oxydimorphin takes place not simultaneously, not 'in a breath,' therefore, but one after the other. So long as morphin is being administered to the organism, the oxydimorphin cannot develop its effect; the latter appears only when the morphin is withdrawn. I shall return to this later. We must also distinguish between morphin administration and morphin effect, which, as already shown, do not cover each other but stand in a definite relation to each other, the disturbance of which determines tolerance, because despite increased administration the effect slackens.

"Of special significance in the pathological picture of morphinism is the *'craving'*—in every respect the most important symptom.

"In order to have a correct understanding of its development, one should not overlook the fact *that the continued administration of morphin exerts an entirely different effect on a morphinist from that exerted by a single medium dose of morphin injected into a healthy person.* While the latter causes nausea, even vomiting, feeling of faintness, heart-weakness, pulse-acceleration, and lowering of blood-pressure, the former occasions just the opposite feelings, sensations, and states—namely, pleasant feeling, euphoria, increased power, and in the heart and vessels, strengthening of the contraction, invigoration of the pulse, and rise of the blood-pressure. Since every morphinist has once had the first morphin injection, there arises the question: by what means and at what time of the continued abuse does this reversal of effect take place? It is brought about as follows. The morphin, originally *foreign* to the body, becomes an *intrinsic* part of the body, as the union between it and the brain cells keeps growing stronger; it then acquires the signficance and effectiveness of a heart tonic, of an indispensable element of nutrition and subsistence, of a means for carrying on the business of the entire organism. In the first years of our knowledge of morphinism, a sharp distinction was made between 'chronic morphin poisoning' (Burkart, 1877) and *'morphin-craving'* (Morphinsucht) (Levinstein, 1875), and the development of the craving was regarded as the sign of the reversal or of the transition from the first to the second. The observation was correct, even if the explanation did not come until 20 years later. This reversal does not occur abruptly, but very, very gradually. If morphin is withdrawn *before* this reversal, the abstinence symptoms do not appear. If, however, the withdrawal is made *after* this reversal, then there comes into existence a 'vacuum' as Legewie says, i.e., the abstinence symptoms, that host of painful sensations, intolerable feelings, oppressive organic disturbances of every sort, combined with an extreme psychic excitement, intense restlessness, and persistent insomnia. In such moments the *craving for morphin* is born and rapidly becomes insatiable, because the patient has learned during the period of habituation, when abstinence symptoms always set in after the effect of the last morphin dose had passed off, that those terrible symptoms are banished as if by magic by a sufficiently large dose of morphin. Whether the craving then directs itself to a single, definite, elective effect of morphin, whether it is dependent on that, is an idle question, for the patient, as a rule, has no knowledge of fine pharmacological distinctions of this sort, and even if he were acquainted with them, such a therapeutic differentiation is a matter of complete indifference to him in the terrible and exciting moments of abstinence; he requires alleviation and removal of his complaints, and to that end resorts to morphin because he knows that precisely this remedy can remove his complaints with utmost certainty and swiftness. The craving may, therefore, be conceived theoretically as a passionate desire for comfort, alleviation, and help, provoked by physical complaints, or at all events, generally augmented by illness, or—to follow up Legewie's conception of the vacuum—it may be designated as a 'desire for being filled.' In so speaking, I am thinking first of all of the cardiac weakness and the lowering of the blood-pressure. Practically, however, it is to be conceived and estimated as a thoroughly psychopathic or even psychotic symptom, which is just as peculiar to the morphinist as to the alcoholic, the opium-smoker, and the cocain-sniffer, but also as to the habitual thief and the moral delinquent—except that in each case the object of the craving is different.

"Recently, of course, an explanation of morphinism has been sought in our broadened views regarding the *autonomic nervous system and the function of the endocrine glands.* In this connection there are two theories, as yet quite unreconciled.

"Otto Wuth seeks, first of all, to explain addiction and abstinence as results of disturbances of the vegetative nervous system and says that in the former the parasympathetic tonus is raised, while the sympathetic is lowered, and that in abstinence, on the other hand, the parasympathetic tonus is lowered and the sympathetic raised. In addition, he believes in the participation of the endocrine glands, and principally of the thyroid gland in the pathological picture of morphinism, and this in the sense of a *lowering of the activity of the thyroid gland during the addiction stage and an increase of the same during abstinence;* he does not, however, settle thereby the question of the primary point of attack of morphin. He then gives an explanation of the symptomatology of the disease, which is somewhat prepossessing: Morphin is administered to the body for various physical and psychical complaints. It acts as a depressant on the function of the thyroid gland and of the organs which have nervous and humoral connection with it (sympathicus, adrenal system), i.e., as a stimulant of the parasympathetic tonus. Now the organism endeavors to restore the vegetative-endocrine balance which has thus been disturbed, and to bring the heightened tonus down to the desired level. Consequently it is necessary to enlarge the dose in order to obtain the same effect from further morphin administration. Thus Wuth explains the cause of addiction. To this there is added a second consideration. Animals which have no thyroid gland have a diminished sensitiveness to morphin. In the use of morphin, therefore, the diminished efficacy of the poison is conditioned by the depression of the function of the thyroid gland. Wuth also calls attention to the fact that psychopaths are the very individuals who are continually complaining of their countless vegetative-neurotic symptoms, and he finds in this the explanation for the fact that *psychopaths are precisely the individuals who represent the largest contingent to morphinism.* He then—to dispose of the matter here—evaluates this hypothesis for therapeutics and demands a remedy for the control of abstinence symptoms which shall act as a depressant on the endocrine-vegetative tonus, i.e., the sympathetic, though no view holds this raised during abstinence, and he believes that he has found such a remedy in cholinum hydrochloricum.[65] I shall return to this later.

"Erich David has arrived through his experiments with reference to addiction at *precisely the opposite results.* He has to admit, however, that certain particular symptoms of both the addiction and the abstinence period do not fit into his scheme and find a better explanation in Wuth's conception. He assumes for addiction a diminution of the parasympathetic tonus, but admits that the contraction of the pupils and the retardation of the pulse during this period can be ascribed only to an increase of the parasympathetic tonus, which Wuth does assume for this period. In accord with his conclusions regarding the biotonus as a whole, he tries to explain also the *psychic* symptoms of the three stages of morphinism assumed by him. For to the periods of addiction and abstinence be adds a third—that of convalescence, which begins when the body weight begins to increase after the withdrawal has been completed. The stage of addiction he likens to the melancholic phase of manic-depressive insanity. I must observe here that the detailed description given by him of the general psychic disposition of a patient during this period applies at most only to *'Grammatiker'*[66] and even to these only after many years of abuse. The withdrawal stage resembles, according to him, the manic-depressive mixed states while for the stage of convalescence he finds a counterpart in the manic phase. In conclusion David concedes 'that just as with Basedow's disease, there is a striking similarity between the second stage, that of withdrawal, and Freud's anxiety-neurosis, in which we must, in all probability, assume a disturbance of the endocrine activity of the genital glands.' He then produces his theory of morphinism, according to which we must think *'that morphinism involves an exogenously produced lesion of the vegetative centers, by which metabolism is regulated, in the basal ganglia of the midbrain.'*

---

[65] A decomposition product of the labile phosphatides (lecithins) found in all the organs of the body.

[66] In the jargon of the morphinists, those who inject more than 1 g. daily.

"Various objections may be offered to these explanations. For example, it is not proper to compare the effects of a single dose of morphin administered to a *healthy* person with the effects which appear in addicts. Furthermore, I do not consider it admissible to apply without reservation the results of animal experiments as to addiction to human beings. Quite apart from the fact that this is absolutely inadmissible as regards the small laboratory animals (rats, pigeons), even morphinized dogs, which had been morphinized with increasing doses in order that the experiment might approach as closely as possible the conditions for human beings, are far from presenting the entire picture of physical addiction symptoms in human beings, and show no abstinence symptoms whatever even on abrupt withdrawal.[67] Finally, it should not be forgotten that, quite apart from the fact that, as Ganter says, 'the terms sympathicotonia and vagotonia are handled somewhat too freely,' sympathicotonic and vagotonic stimulations frequently run alongside each other, that they appear simultaneously, that they are, therefore, not to be sharply distinguished from each other in so complicated a complex of symptoms as morphin abstinence, and may not serve as a certain basis for a final explanation of the latter. Thus, for example, the augmented cardiac frequency of the abstinence period depends on the raising of the sympathetic tonus, while the diarrhea occurring at the same time depends on the raising of the parasympathetic tonus. Or, according to Glaser, we find the same increase of the sympathetic tonus in the addiction period (suppression of saliva, dryness of oral mucous membrane, stoppage of the gastric juice secretion with resulting constipation) and also in the abstinence phase (acceleration of cardiac activity), while the hyperhidrosis present at the same time in the latter is dependent on a raising of the parasympathetic tonus. According to this, the antithesis between Wuth and David—both of whom seek to explain the phases of addiction and abstinence as totalities conditioned by this simultaneous appearance of sympathicotonic and vagotonic stimulation—could in reality be only an apparent one.

"So far as practice is concerned, these theoretical and discordant speculations bring us not a step forward; on the contrary, they unhesitatingly lead the patient back to morphin instead of setting him free. Wuth himself says that during the withdrawal 'the general narcosis of all the vegetative centers by means of fever narcotics[68] or *by means of small morphin doses continuously administered throughout the earlier period* (*slow withdrawal*) *is not to be neglected.*[69] Without doing violence to these words, it must be said that out of regard for his theory, Wuth again recommends slow withdrawal, long since discontinued. That would be a serious relapse. This recommendation is not modified or mitigated by the fact that *'small morphin doses'* are to be given only throughout the *'earlier period,'* for the former as well as the latter are relative concepts, which are determined more by the subjective attitude of the physician than by the objective indications and requirements of the symptoms. And when Wuth adds a few lines farther on 'that, starting from our view regarding the nature of morphinism, we have before us numerous new therapeutic methods,' and when in another place he designates as the next task 'the opening up of a new fertile field for therapeutics in a different and hitherto neglected sphere, on the basis of his hypothesis,' I cannot subscribe to such a conception. I must point out first that precisely the control of abstinence symptoms by means of even *small morphin doses* may become one of those sources from which the danger of a relapse takes its growth. Next, I must emphasize the fact that all treatment of individual abstinence symptoms is always only a symptomatic alleviation of the patient, and that the aim of the treatment, or better, the principle of the cure cannot possibly consist in the discovery of a remedy ingeniously thought out on the basis of theories and hypotheses, but solely and alone in prophylaxis: *We must come to know the cause of the abstinence symptoms as a totality of symptoms, we must disregard the troublesome doctrine of the elective action of morphin, and we must find a remedy or procedure, which will aid us to remove the cause of the abstinence symptoms, and to prevent their appearance.*

---

[67] Obersteiner had established even in 1883 that rabbits which had been habituated to morphin by injections (up to 0.4 daily) administered through a period of 3 months, *never* displayed abstinence symptoms on sudden withdrawal. (Wien. Klinik, March, 1883.)

[68] These are according to Schmiedeberg, among others, the antipyretics like antipyrin, phenacetin, pyramidon, etc.

[69] Italics are mine. (E.)

"How far we are led from our goal by the explanations founded on the functions of the autonomic nervous system, the following discussion may show. If, among the abstinence symptoms, the flow of tears and saliva, the copious secretion of perspiration, the increased excretion of gastric juice accompanied by gastric and intestinal pains and diarrhea, and also vasomotor disturbances accompanied by arrhythmias of the heart, are to be regarded as vagotonic, and therefore parasympathetic symptoms, then atropin should surely banish all of them. But in reality atropin is of no avail against these abstinence symptoms—at any rate, not in the permissible doses.

"It is equally impossible to harmonize these recent explanations and their proposed therapeutic methods with the earlier conclusions as to the behavior of the heart and the blood-pressure. Years ago I demonstrated by means of sphygmographic investigations[70] that the full, powerful, and regular pulse of a morphinist becomes during the abstinence period small, weak, more rapid, frequently arrhythmical and dicrotic, giving evidence thus of cardiac weakness, and that a sufficiently strong injection of morphin quickly restores to this pulse its former powerful qualities. Next I determined by means of auscultatory measurements the systolic and diastolic blood-pressure, and I discovered that, as a result of the withdrawal, the pressure is lower than it was before the beginning of the withdrawal, i.e., when it was still under the influence of morphin, but that it may be restored to its previous height by means of a copious morphin injection. Wuth now asserts that the blood-pressure is raised during the withdrawal period and recommends for the purpose of lowering it intravenous infusions of cholinum muriaticum. To this I have two objections. In order to settle objectively this antithesis of opinions, I once requested the 'Psychiatrische und Nervenklinik' of Cologne University (Professor Dr. Aschaffenburg) to undertake blood-pressure measurements in connection with their withdrawal curves. These turned out in accord with my earlier discoveries and views. Dr. Kurt Blum, Assistant Physician of that clinic, sent me the following report:

---

[70] The sphygmograms are published in the 3rd edition of my book: Die Morphiumsucht und ihre Behandlung.

"W.W.; 42 years old; wounded in 1917; right leg amputated in 1921; morphinist since that time; as stated, 3 injections daily. Admitted August 20, 1925. Blood-pressure 110/60. Immediate complete withdrawal. During the second night, intense restlessness, small, frequent pulse. Blood-pressure 100/60. Because of this, 0.01 M. The very next day, blood-pressure 120/65. Hence, morphin restored the blood-pressure which had fallen during the abstinence period.

"Next, I am unable, despite the best intentions, to discover in the publications of Klee and Grossman, who, on the basis of Wuth's hypothesis, applied cholinum muriaticum in two cases, any confirmation or support of that hypothesis. Regarding one patient, in whose case the investigation lasted 3 weeks, they say: 'The patient, who before the cholin infusion was feeble, apathetic, or excited, became, even while the infusion was being made, vigorous, lively, and talkative. The pulse became full and tense.' For 5-8 hours the hunger for morphin was completely stilled. The dose which was withdrawn is not stated. Regarding the second patient, who had injected daily up to 2 g. of eukodal, they report: 'Here, too, the patient looked more vigorous immediately after the injection. She became livelier, and—what was especially striking—the previously irregular, small pulse became regular and full like a digitalis pulse.' And in another place they make the general statement: 'With a certain concentration (of the infused cholin solution) in the blood, there appears, with few exceptions, a noticeable slackening of the pulse-beat (5-10-20 per minute). The pulse often appears to the feeling finger as if *under the influence of digitalis.* Extrasystoles were rarely observed.' These words, as I understand them, allude to that regulatory effect of digitalis, which raises and augments the low blood-pressure in case of cardiac insufficiency. Moreover, when the circulation is undisturbed and the cardiac nerves are intact, the decrease of cardiac frequency speaks for a heightening of the blood-pressure. Finally, I call attention to the observation cited above, which Marmé made in the case of dogs which had been treated with oxydimorphin. If Marmé's hypothesis is correct, then these findings, applied to human beings, show that cardiac weakness and lowering of the blood-pressure appear during the withdrawal period of morphinism.

"The question suggests itself as to the reason for these contradictory views. The answer, too, is obvious. It is in effect that we are not justified in expecting or supposing that the cardiac weakness and lowered blood-pressure produced by a single, medium injection administered to a healthy man will also follow the habitual use of morphin by a morphinist. Disregarding the fact that according to general experience, morphinists are individuals with impaired nervous system (psychopaths), on whom, as is well known, all opiates, including morphin, have a restorative and stimulating effect, surely the transformation of morphin, originally *foreign* to the body, into something which is an *intrinsic part* of the body and a necessary and indispensable means for vital activity, together with the increase of power to work and achieve resulting therefrom, point to the fact that no cardiac weakness, no vascular atony, no lowering of the blood-pressure, can be connected with it. *The cardiac-vasomotor state of morphin addiction is hypertonia, that of morphin withdrawal atonia.*

"Of the more recent theories regarding the nature of morphinism, none has given a complete, generally recognized explanation. Nevertheless, I shall not succumb to the obvious temptation of advancing a new one. I shall, however, call attention to two older ones, which have almost fallen into oblivion.

"One, no doubt the first and oldest, which in all modesty, however, did not yet claim the name of a theory, comes from the time when 'morphin abuse' was still regarded as a curiosity. It furnished the basis for the 'gradual withdrawal' and said that the symptoms which developed during the addiction or intoxication period faded and receded during the withdrawal cure. Its substance was the aphorism: *Cessante causa cessat effectus.* (When the cause ceases, the effect ceases.) In proportion to the size of the dose withdrawn, this simple fading and recession turned into symptoms which were the *reverse* of the intoxication symptoms—which even passed over into violent, and often explosive, symptoms, when Levinstein's 'abrupt withdrawal' came into vogue. They impressed themselves as something new, and for that very reason were not understood at first. This increase to violent contrast with the intoxication symptoms was most distinct in the behavior of the gastric juice: During the intoxication period, as a result of the narcotic effect of the morphin excreted into the stomach, the gastric juice glands are 'lulled to sleep' and finally suspend their function altogether with consequent anacidity of the gastric contents and constipation—during abrupt withdrawal, on the other hand, these glands awaken to a violent resumption of their function with consequent hyperacidity of the gastric contents and severe attacks of diarrhea. It might have been said, and it has been said, that with the *smallest* withdrawal of the habitually injected poison, a withdrawal cure might run its course almost without a symptom. But just there lay the impossibility of carrying it through. If, for example, 1 mg. of morphin were to be withdrawn daily—which can be done without producing the least abstinence symptom—from a morphinist with a daily consumption of 0.5 g. through months and years, 500 days would be required for the withdrawal cure. Time and money are both lacking for such a cure in a hospital, while the patient, if left to himself, cannot summon the necessary will-power, firmness, and self-control. A cure of this sort, therefore, was and is unfeasible in practice, however correct it may be in theory. But the thought on which it was based *explained*—and that is our concern here—*the nature of morphinism*—an explanation which permits either the destruction or the binding of morphin in the organism, or both, to be adduced as cause of the addiction and the increase of the dose accompanying tolerance or immunity.

"The second of the older theories is the one set up by Marmé—that *abstinence symptoms are to be conceived as oxydimorphin poisoning.* I have already made mention of it. The decision as to its validity depends on the question whether in the habitual misuse of morphin the balance of effect falls to morphin or to oxydimorphin. This is of especial importance with regard to the effect on heart and vessels. Oxydimorphin develops from the injected morphin, but it becomes effective only when the morphin has ceased to be so. This undoubtedly happens several times a day, according as the morphinist is accustomed and able to make his injections more or less frequently. But however often it may happen that the fresh injection is delayed, i.e., that it is made some time after the effect of the previous injection has passed off, so that opportunity is given for the development of the oxydimorphin effect—*at all events, the morphin doses are always chosen strong enough to overcome and annul the oxydimorphin effect,* and then the duration of the morphin effect is always much greater than that of the oxydimorphin effect. There cannot, therefore, be any doubt as to the fact that in the oscillating play of morphin and oxydimorphin effects, as continually displayed in the life of a morphinist, the first is by far preponderant. The heart of a morphinist, therefore, enters the withdrawal cure, not relaxed and weakened through the effect of oxydimorphin, but, on the contrary, well prepared and equipped for the struggle with the morphin withdrawal through a previously acquired hypertonia. From the teleological standpoint, therefore, we must wonder at the curious fact, already pointed out, that morphin under conditions of addiction produces an effect contrary to that produced by morphin administered but once, for if the withdrawal had to be got over with a heart which had had its power of resistance reduced once by morphin (with its peculiar property of weakening the heart and lowering the blood-pressure when the dose is isolated) and again by oxydimorphin with its simlar effect, then a withdrawal cure would surely be a procedure extremely perilous to life. The first supposition does not hold, however. Since abstinence resulting from quick and sudden withdrawal of the habitual stimulant always *brings the contrast of the symptoms of addiction,* then, if addiction morphin also weakened the heart and lowered the blood-pressure, the beginning of the withdrawal would encounter a hypertonic heart, and could, therefore, be endured much more easily. And even if this more vigorous heart served only to paralyze the heart-weakening effect of oxydimorphin, which in any case does make its appearance during the withdrawal cure, then the entire situation during the abstinence period would still be better than it actually is. *Precisely in the difference between the effect produced by a dose of morphin administered just once to a healthy person and that produced by morphin when habitually incorporated, lies the fatal development of the morphin craving,* and the question I raised once before is still justified—namely: *Might not humanity have been spared the morphin craving, if the effect of morphin on heart and vessels were such as weakened the heart and lowered the blood-pressure also in the case of habitual administration of large doses?* I answer this question in the affirmative with complete conviction.

"So long as no casual treatment of the abstinence symptoms is possible, i.e., so long as there has been no remedy discovered or method devised for preventing their appearance, their treatment can be symptomatic only. For such the following directions may be of value:

"1. Rapid withdrawal under conditions which guarantee certain and safe accomplishment.

"2. Treatment of the gastro-intestinal symptom-group by alkalization of the gastric and intestinal contents through the oral or rectal introduction of large quantities of alkalic-muriatic mineral water, freed as much as possible from CO_2. Internal lavage.

"3. Treatment of the cardio-vascular symptom-group by remedies which regulate cardiac frequency and rhythm and raise the lowered blood-pressure. It is best to introduce this prophylactically.

"4. Treatment of the neuro-cerebral symptom-group by sedatives and hypnotics which should be changed daily and which, of course, should not be chosen from the morphin-group.

"5. Dependable supervision during convalescence. Abstinence from alcohol. Occupation and work in gradual amounts carefully determined.

"For details, see my work on the *Treatment of chronic morphinism* which has just appeared in the Sixth Edition of Penzold and Stintzing's *Handbuch der gesamten Therapie.*"

Ministry of Health of Great Britain—Departmental Committee on Morphin and Heroin Addiction—1926.[71]

This Committee,[72] after listening to proponents of different forms of treatment, which involved abrupt withdrawal, rapid withdrawal and gradual withdrawal, together with the use of medical and other adjuvants, came to the following conclusions:

"Opinion was, on the whole, strongly in favour of the gradual withdrawal method in preference to either of the alternative plans. The evidence appears to show that it is more generally suitable, and more free from risk than either the abrupt or rapid withdrawal methods. It entails less strain and distress upon the patient, is unattended by collapse, and other withdrawal symptoms may in large measure be prevented by its adoption.

"Though there was thus a distinct conflict of opinion as to the merits and demerits of the various methods, the following inferences may, we think, be regarded as established:

"(a) That each patient requires individual consideration.

"(b) That abrupt or rapid withdrawal may be advisable in cases of young healthy adults in whom the addiction is of recent date and only moderate doses are being taken. Otherwise, the gradual method is to be preferred.

"(c) That abrupt or rapid withdrawal is specially dangerous in the case of old or seriously debilitated persons, of patients with advanced organic disease, and those who are taking exceptionally large doses.

"(d) That abrupt or rapid withdrawal should not be carried out except in a well-appointed institution and with the aid of skilled nursing and constant medical supervision. It is therefore, unavailable for the treatment of those who cannot or will not enter institutions.

"(e) That it would be unsafe to draw any conclusions of a general nature from the peculiar success which appears to have attended the prison

---

[71] Ministry of Health. Departmental Committee on Morphin and Heroin Addiction. Report. His Majesty's Stationery Office. London, 1926.

[72] For the membership of this Committee see page 131, footnote.

> cases treated by the abrupt method. These persons were confined under close observation and subject to a discipline more strict than could be enforced in any voluntary institution; they received prompt medical aid in any emergency, and the dose of drug that had been habitually taken by most of the prison addicts appears to have been comparatively small."

In their consideration of the prognosis in these cases and of the importance of permanent cure, the Committee reports as follows:

"It was specially insisted upon by several witnesses that the actual withdrawal of the drug of addiction must be looked upon merely as the first stage of treatment, if a complete and permanent cure is to be looked for. As one witness put it, the real gain to the patient by withdrawal of the drug is to enable him to make a fresh start in new and more favorable circumstances, and little more than that can be expected from the actual treatment itself, whatever the method employed. A permanent cure will depend in no small measure upon the after-education of the patient's will power, and a gradual consequent change in his mental outlook. To this end it was regarded as essential by one witness that full use should be made of psychotherapeutic methods, both during the period of treatment and in the re-education of the patient. It was not considered that a lasting cure could be claimed unless the addict had remained free from his craving for a considerable period—1½ to 3 years—after the final withdrawal of the drug. Scarcely less important than psychotherapy and education of the will is the improvement of the social conditions of the patient, and one physician informed us that he made it a practice, wherever possible, to supplement his treatment by referring the case to some Social Service Agency. It was also regarded as important that the physician in charge of the case should, while the patient is under his care, make a thorough study of the causes, pathological and other, which originally led the patient to take drugs, and try to remedy them. Pain, insomnia or other physical malady must be suitably treated before the patient is released from observation.

"Prognosis.

"Evidence we have received from most of the witnesses forbids any sanguine estimate as to the proportion of permanent cures which may be looked for from any method of treatment, however thorough. Relapse, sooner or later, appears to be the rule, and permanent cure the exception. With two exceptions, the most optimistic observers did not claim a higher percentage of lasting cures than from 15 to 20 per cent. One eminent authority, however, who employs the abrupt withdrawal method reinforced by certain auxiliary measures of a drastic character, was of opinion that a real cure may be expected in about 66 per cent. of the cases in which the patient is willing to accept treatment and in whom the treatment is not contra-indicated. The witness who had practised the rapid withdrawal method (referred to in paragraph 39) gives a percentage of cures as high as 70 per cent., but other observers who have tried the method have failed to obtain successful results in such high proportions. In this connection may also be mentioned the remarkable results obtained by one of the general practitioner witnesses who, by the employment of the gradual reduction plan, had obtained success in 8 cases out of 12 which he had treated. Some of these cured cases had been under observation for years and had not relapsed.

"While therefore, the ultimate outlook in any individual case is always serious it can by no means be considered hopeless and every effort should be made by thorough and suitable treatment to free the patient from his addiction. It must be borne in mind, however, that those witnesses who were most sanguine as to the proportion of permanent cures that could be obtained under the best possible treatment, recognized that the results they described could only be secured by treatment in institutions. Looking to the small number of such institutions in this country, as well as the cost of the treatment which, reasonable as it usually is, is beyond the means of some of the patients, and the impossibility under the law as it stands, of compelling persons suffering from addiction to become inmates of institutions, it is clear that under present conditions there must be a certain number of persons who cannot be adequately treated, and whom it is impossible completely to deprive of morphine which is necessary to them for no other reason than the relief of conditions due to their addiction."

George S. Johnson—1927.[73]

In twenty-four "unselected cases addicted to the use of opium or its derivatives" this author employed narcosan and was able to check the subjective and objective effects of this preparation with twelve cases treated according to the ordinary hospital routine: namely, abrupt withdrawal of all narcotics, with the use of bicarbonate of soda to combat any acidosis, detoxication by the daily use of high colonic irrigations, and the control of restlessness by the use of continuous baths.

The narcosan was administered according to direction and certain routine daily observations were made in regard to appetite and sleep. Except for the substitution of narcosan, the cases were treated exactly as were the control cases; so that the author believes that results were comparable. Two of the twenty-four patients underwent both types of treatment at different times.

The author reports on his study and findings as follows:

"Publicity attendant upon the introduction of the narcosan treatment resulted in twenty-two of the twenty-four cases entering the hospital thoroughly convinced of the efficacy of the drug. In view of the well known suggestibility of these patients, we feel that this has been an important factor in the subjective reactions to treatment.

"All of the patients treated showed the characteristic withdrawal phenomena to a greater or less degree. Seventeen showed nausea and vomiting and they and the remaining seven showed restlessness, irritability, abdominal cramps and pains in the legs. Eleven patients stated that they were definitely relieved by narcosan injections, seven stated that they could see no influence on their immediate withdrawal symptoms and the remaining six were definitely opposed to the use of narcosan, feeling that it added to their discomfort.

---

[73] Johnson, George S.—The use of Narcosan in the treatment of drug addiction. Colorado Medicine, Vol. 24, No. 11, November, 1927.

"Only one patient showed abnormal blood sugar, having 139 mg. per 100 cc. of blood on the morning after admission. This blood sugar was 92 mg. per 100 cc. three days later. The remainder of the patients showed a range of from 82 to 116 mg. per 100 cc. There was a definite rise in the non-protein nitrogen of the blood, the average determination on admission being 30 mg. per 100 cc. and the average determination on the third day being 36 mg. per 100 cc. The extremes noted were 24 and 36 mg. per 100 cc. on admission and 30 and 48 mg. per 100 cc. on the third day. The urea nitrogen showed a similar change, the average determination on admission being 13.5 mg. per 100 cc. and the average for the third day being 18.5 mg. per 100 cc. The extremes noted here were 11 and 16 mg. per 100 cc. on admission, 15 and 26 mg. per 100 cc. on the third day. In all of these patients the blood chemistry determinations were within normal limits upon discharge from the hospital. Leucocytosis, with a relative polymorphonuclear increase was noted in most of these cases under treatment. The extremes noted were 5,400 cells and 19,300 cells with an average of 12,600 cells. The percentage of polymorphonuclear cells ranged from 63 to 92, the average being 77 per cent. The urine examinations showed a high specific gravity during the period of emesis and diarrhoea and a few showed indican and albumin at that time, but no other changes were noted.

"The influence of narcosan on the amount of sleep obtained by the patients undergoing treatment has been stressed in the report previously mentioned and careful observations were made in this regard. The average amount of sleep obtained during the first 96 hours under treatment was 16 hours or an average of 4 hours per night. During the second period of 96 hours an average of 24 hours' sleep was obtained, an average of 6 hours per night. During the remainder of their stay in the hospital the patients averaged 6½ hours' sleep per night.

"Contrasted with this sleep record is the record of those patients treated in the Colorado Psychopathic Hospital before narcosan was used. During the first 96 hours this group averaged 20 hours of sleep, an average of 5 hours during each night. In the second 96 hours, an average of 25 hours' sleep was obtained or 6¼ hours per night. During the remainder of their stay in the hospital, an average of 7 hours of sleep per night was obtained.

"The sleep curve of the two patients who have taken both types of treatment is interesting. The first patient slept on an average of 4 hours per day during the first 4 days under narcosan and an average of 7 hours per day under the routine hospital treatment. During the 2nd period of 4 days, 6½ hours of sleep were obtained under narcosan and 7 hours of sleep under the hospital routine. The second patient slept 5½ and 6½ hours per night for the two periods under narcosan and 7 hours each during the two periods under the hospital routine. Both of these patients attested the advantages of each method of treatment and both returned to the use of the drug shortly after their release from the hospital.

"The information gained from a study of the weight curves of these two groups of patients was not significant. Each group showed a rapid loss in weight during the period of the acute withdrawal symptoms with a rapid return to their admission weight or more."

* * * * *

"The follow-up reports have not been encouraging. Of the 24 patients treated, only 9 had permanent addresses. Information of the remaining group was obtained from other associates. Information has not been obtained on six. Of the 18 about whom reports have been obtained, 11 have returned to the use of drugs. Of the control group there was no information on 8, but 4 were known to be off of drugs."

* * * * *

"CONCLUSIONS.

"1. Patients treated for narcotic addiction by the use of narcosan show the usual withdrawal signs.

"2. Of 24 patients treated, 11 were subjectively relieved by the narcosan while 13 could see no effect or were made uncomfortable.

"3. Of the 11 patients who were subjectively relieved by the narcosan, 7 were known to have returned to the use of morphine and the status of three is unknown.

"4. Narcosan is not as effective in controlling sleeplessness and restlessness as methods previously employed at the Colorado Psychopathic Hospital.

"5. Narcosan is not of any added value in the treatment of drug addiction and this treatment remains a psychiatric problem."

M. G. Carter, T. J. Orbison, E. H. Steele, C. A. Wright and E. H. Williams—1927.[74]

These authors review the theories of Lambert and Tilney on the action of narcosan in the treatment of opium addiction, that narcotics "call forth in the body certain protein substances to neutralize them" and that these substances are toxic and are neutralized by the lipoids in narcosan when the narcotic is withdrawn. They disagree with this hypothesis and also with that to the effect that there is a definite toxic substance in the blood as a result of morphin taking or withdrawal. They state their reasons for disagreement and their own theories as follows:

"We disagree with this clinical deduction because it seems to us that the evidence presented by the clinical picture of addiction, and certain chemical features, indicate primarily rather a disturbance of the endocrine system—either primarily or secondarily to the sympathetic nervous system. There is no question about the endocrine hypofunction in these cases, as indicated by the lowered blood pressure, low basal metabolism, and generally weakened condition, which may be improved by direct action of endocrine substances. This was suggested several years ago in the book *Opiate Addiction* by Edward Huntington Williams, the Macmillan Co., 1920. Also, the symptoms presented in so-called withdrawal, which, most significantly, are more uniform than in almost any other form of disease, are apparently manifestations of a disturbance of the endocrine system—hypoendocrine rather than toxic, in our judgment.

---

[74] Carter, M. G., Orbison, T. J. Steele, E. H., Wright, C. A., and Williams, E. H.—The proteal treatment of drug addiction. Medical Journal and Record. New York. September 7, 1927. pp. 282-284.

"Our opinions on this subject were formed after a clinical, pathological, and chemical study of drug addiction cases over a period of several years, observations of numerous forms of treatment and experimental treatment directed to stimulating and sustaining the endocrine system during the withdrawal of the drug. This was done by the administration of various endocrine substances themselves, and also by the solution of vegetable proteins administered hypodermically. The cases in which this treatment was given showed such satisfactory results as to still further confirm our belief that our theory of endocrine involvement in drug addiction and withdrawal is more tenable than Bishop's theory of special toxic substances in the blood. In this connection it seems significant that many observers who have administered nonspecific vegetable proteins, regard their action in the body as stimulants to the endocrine system—vegetable hormones, someone has called them.

"Now, it happens that narcosan contains one of these vegetable protein substances, alfalfa protein, apparently prepared in practically the same manner as is described in the preparation of 'alfalfa proteal No. 39,' which is available and on the market, and has been for several years. The action of this vegetable protein suggests that it is an endocrine stimulant, hormonic in action, and it appeared to us in observing cases of drug addiction undergoing narcosan treatment, that the effects produced were those of a protein stimulant—an endocrine system stimulant—rather than the neutralizing of a toxic substance in the patient's blood. The effects are similar to these produced by alfalfa protein alone."

They state that in their experience, patients treated with alfalfa protein alone present the same clinical picture, have just as little suffering and are in quite as good condition at the end of their treatment as are those treated with narcosan. Acting on their belief that the symptoms of morphin withdrawal are due to "a functional upheaval in the endocrine system rather than of a toxic nature and that hormone balance might be restored or assisted by the use of certain endocrine products in addition to the alfalfa proteal" they instituted the following treatment:

". . . . Thus, in addition to the proteal of alfalfa, administered as referred to above, the male patients were given five c.c. of orchitic substance injected into the gluteal muscles in the beginning of the treatment and repeated at three day intervals. In the female patients a preparation believed to be the ovarian hormone (so thought by the manufacturers, and certainly an active preparation) one c.c. was administered daily.

"The results of this treatment obtained in a series of six cases up to the time of making this report (and a considerably larger series since then) were most gratifying. The patients suffered little discomfort, some of them none at all, most of them were able to be up and about the wards rather than confined to bed, and the nursing care was minimized being much less than in any other form of treatment that we have observed except narcosan.

"In addition to this treatment primarily, we found it expedient to keep the patient alkalinized with sodium bicarbonate, and, to combat the inevitable nervousness, we administered strychnine, one thirtieth of a grain hypodermically every six hours, as suggested by Lambert and Tilney in their narcosan treatment. Strychnine was the sheet anchor of the treatment given by the late Dr. Bishop, and its value is recognized by every one who attempts the treatment of drug addiction.

"It will be seen from the above that this proteal treatment, as we call it for convenience in designation, is essentially a foreign protein endocrine treatment. Clinically it seems to be highly satisfactory, quite as much so as the narcosan treatment. Financially, it has the advantage that the protein substances used are inexpensive costing only a few cents for the treatment in comparison to the rather large number of dollars required for the purchase of narcosan.

"Moreover, these proteals are not a patented preparation—no secret formulas—but are open to anyone, and can be prepared by any reasonably skillful laboratory worker at a cost of only a few cents."

The authors summarize as follows:

"1. The patients taking proteal treatment suffered very little discomfort, and remained in comparatively good physical condition.

"2. Necessary nursing care was minimized.

"3. It is probable that such vegetable proteins as those from millet, rape, hemp seed, etc., will give quite as satisfactory results as the alfalfa protein, since there is a definite and similar response when they are administered.

"4. The action of the foreign protein in these cases seems to be fortified by the simultaneous administration of such endocrine preparations as orchitic substance and ovarian products. The rationale of this is suggested by the fact that drug addiction almost invariably affects sexual function.

"5. There is also considerable evidence suggesting that testicular and ovarian preparations when administered act as 'general stimulants' to the entire endocrine gland system. If this is true, certain x-ray treatments ought to be helpful in these cases.

"6. Proteals are neither secret nor patented preparations. They cost only a few cents, either to make or to buy."

Lawrence Kolb—1927.[75]

In a second article dealing with his studies of a series of 210 cases of addiction among all social groups, Kolb reports his findings as to the cause of the so-frequently occurring relapses following curative treatment. He states that at the present time relapse is more common than formerly because recently-adopted narcotic control measures have been more effective in preventing the addiction of stable, normal persons, than of unstable, psychopathic persons, and further, the coercive features of narcotic laws have forced a cure of the more hopeful of the curable cases, and that now it is those who by nature are more predisposed to relapse who become addicted, thus creating a class of addicts which is peculiarly liable to relapse. He further states in this connection that although relapses have always been frequent, they have never been so frequent nor has permanent cure been so difficult as is commonly supposed, and that the popular misconception about the difficulty of permanently curing drug addiction is traceable to two factors, as follows:

> "(1) As a rule drug addicts as well as their physicians conceal the addiction as long as it is possible to do so, consequently the addiction of cured cases is seldom heard of before cure is effected and is never mentioned afterward; (2) the repeated treatments of so many relapsing cases make a one-sided impression on the uninformed and unreflective mind. By a study of the subject we have been led to believe that there are thousands of cured addicts in the United States today, and if we class as former addicts all of those persons who after several weeks of opiate medication suffered for a few days with mild withdrawal symtoms—such as restlessness, insomnia and over-activity of certain glandular functions—the number of cured addicts must exceed those who remain uncured."

In what follows Kolb gives certain information relative to the cases studied, and reviews the fundamental reasons for relapse:

> "The conclusions of this paper are based on a study of 210 addicts embracing all classes of society, from successful professional men to habitual criminals. They had relapsed a variable number of times ranging from one to twenty. The duration of abstinence from narcotics varied from three days to ten years, but each addict included in this series of cases had abstained at least once for as long as fourteen days. Nearly all of them had been off the drug at one time or another for three months or more and the majority had experienced periods of abstinence for as long as six months. Abstinence was enforced in many instances due to confinement in prison for violations of narcotic laws but all except a few

---

[75] Kolb, Lawrence—Clinical contribution to drug addiction: The struggle for cure and the conscious reasons for relapse. Journal of Nervous and Mental Disease. Vol. 66. No. 1. July 1927.

of the prison cases had sought treatment and voluntarily abstained either before or after their prison terms. The first voluntary abstinence was likely to last longer than subsequent ones. As a rule the time would shorten with each attempt at cure until finally there would be nothing but fruitless efforts at treatment with no abstinence at all.

"The idea is widely held that opiates bring about a state of moral perversity that renders addicts indifferent to cure and therefore liable to relapse, or that in many cases these drugs produce some physical change that makes their continued use necessary and the impulse to return to them irresistible. It seems plain, however, that induced moral perversity has nothing to do with it and that physical dependence upon opium though important is, except in rare cases of prolonged addiction, only temporary and is second in importance to psychological factors in bringing about relapse to the drug.

"It has long been recognized by students of the subject that the addict is generally abnormal from the *nervous* standpoint before he acquires the habit, while some like Block assert that normal persons never become habitués. It is probable that Block does not class as habitués persons who because of certain painful conditions are necessarily addicted in the treatment of them. If his assertion allows for this exception and is limited in application to countries which like the United States have laws that protect people from the consequences of their own ignorance, its accuracy is supported by my own findings. Ninety-one per cent of this group and eighty-six per cent of a group reported elsewhere by me deviated from the normal in their personalities before they became addicted.

"The fact that becomes so clear upon the study of cases, that most addicts are in the beginning abnormal, is in the viewpoint of many persons obscured by the more obvious fact that the habitual use of opium creates in any type of person a temporary physical dependence upon it. This dependence being the most striking thing is often erroneously thought to be the most important, if not the only important, cause of addiction and frequent relapse. The passage within recent years of laws making it a penal offense to possess or sell narcotics and the consequent arrest of numerous addicts who for ingrained mental reasons take narcotics but who for social reasons blame the narcotics themselves, and complain about the physical discomfort of treatment that is so often forced on them, has served still further to concentrate attention upon the less important factor of physical dependence."

In the 210 cases studied, the author finds that psychic causes produced the susceptibility to opiates and cocain, and that the cause for relapse was primarily the same as that responsible for the original addiction, reinforced later by memory associations and habit and by the induced physical dependence that gradually developed, the memory associations and habit being part created by the physical dependence. The primary psychic factor remained fairly stable during the entire period of addiction, while the other three factors increased in intensity with the passage of time, bringing about a change in the relative importance of the various factors. Kolb states:

> ". . . . The force of physical dependence increased more rapidly than the other two variable factors. In persons who had been addicted for no more than a year the primary psychic factor was almost solely responsible for relapse in those who had abstained from the drugs for as much as fourteen days and the importance of physical dependence was insignificant. In those who had been addicted for fifteen years or more the force of physical dependence equalled, if it did not exceed, the primary psychic factor as a cause of the relapses that occurred during the first few months after treatment with complete withdrawal of the drug. The importance of physical dependence as a cause for relapse increased more rapidly in neurotic patients than in those who were considered to be normal. It was so important in some cases of long-standing addiction of nervous persons as to preclude the possibility of recovery by any means except enforced confinement over long periods of time."

As to the attitude of addicts toward their addiction and toward treatment, he says that some cases regard their addiction as beneficial rather than harmful, while others, much more numerous, feel that having progressed to their present state they would be better off if left alone. The former accept treatment only under physical restraint and relapse as soon as they regain their liberty; the latter seek treatment only because of the urging of friends, the difficulty of maintaining themselves as addicts and because of their fear of the law. They usually relapse promptly. The author continues as follows:

> "Most persons who become addicted to opium or its preparations through medical means become alarmed as soon as they become aware of their dependence upon the drug and adopt strenuous methods, if necessary, to throw off the habit. This is easily done in the beginning; those who fail have physical diseases that make the use of the drug desirable or necessary at certain times, or they have psychopathic traits that render them especially susceptible. The medical cases that remain uncured belong to one of these classes. They are always ashamed of their addiction although they often defend it. Shame is a sentiment which affects even the deliberate dissipators; and practically all addicts, except the worst of the criminal psychopaths, would like to be cured. This is true even of those who have given up the struggle and who would spend the rest of their lives without giving a serious thought to another treatment but for the coercive measures that are brought to bear on them.
>
> "That this attitude of indifference to treatment is a late development is shown by the fact that of those who were addicted before the passage of the Harrison Law, comprising 40 per cent. of the total number of addicts in this series of cases, all but three had taken treatment at least once, and some had taken it several times before the law was passed. It is also significant of an earnest desire for

cure that 20 per cent. of the entire number had at some time during their addiction careers voluntarily abstained from the drug and without assistance from physicians, hospitals or prisons, succeeded in breaking the habit. Many of these simply 'lay around home and kicked it out' without telling members of the family the real cause of their discomfort. These successful self-treatments occurred usually during the first two years following the beginning of addiction but they sometimes occurred later, especially in patients who were addicted to cocaine and an opiate at the same time. One of the latter who had been addicted off and on for twenty years got off the drug at home with very little discomfort and without any assistance whatever. One physician, after two years of addiction to morphine, repaired to the woods with a camping outfit and a servant and returned in three weeks cured. He relapsed two years later because of a painful illness and was cured twenty years after this because of the activity of narcotic agents.

"Though the sincerity of addicts who seek cure is for the time being beyond question, the motives which prompt many of them are fundamentally inadequate and therefore usually ineffective.

"The motive for cure in newly created addicts is the instinctive revolt they feel and the vague fears that arise when they find themselves victims of a habit that they cannot control. They discover that they are in a situation that they have been taught to regard with contempt and this creates the alarm above referred to. If cure is not immediately and permanently effected the instinctive fears wane and later on are replaced as motives for cure by well defined fears of the law, by fear of social ostracism or financial dependence, and to a less extent by fear of the physical harm that the drugs might do to them. The discomfort and physical depletion caused by inability to secure at all times an adequate supply of drugs has furnished an added motive for cure to many of those who repeatedly relapse. These addicts after struggling with the situation for a time seek treatment in disgust. Others, less sincere, seek it in desperation because they have no money whatever to buy the drug they need, or because a successful raid by the authorities on peddlers has temporarily cut off their supply. A large proportion of repeaters give as a reason for seeking cure that they have revolted against the idea of giving so much of their money to drug peddlers. An addict who in his motive for seeking cure illustrates the motives that prompt many others, came home one winter night keyed up for the usual dose that had been delayed only to find that his wife, in a burst of indignation, had thrown his heroin away. The street cars being tied up because of a snow storm he walked to his peddler's nearly two miles, through the snow and returned to find that for two dollars he had bought an innocuous drug; another trip brought the same result, and the third one failed to secure even an interview. In disgust he sought and accomplished a cure, but relapsed in a few months. Four years later a shortage of drugs, following a wholesale arrest of peddlers, prompted him to be cured again. He has been drunk three times during the twelve months following this last treatment, but at present writing seems determined not to relapse to narcotics.

"Reasons Given for Relapse

"The reasons the addicts gave to account for their relapses often did not furnish more than superficial evidence of the real cause, but there was a tendency to overemphasize the importance of physical symptoms. A large proportion of the psychopaths, who with full knowledge of its danger, had dissipated with an opiate until they became addicts, were unable to give any reason for the relapses that occurred during the first three years of their addiction. Many of them frankly said that they just started to take the drug again and had no excuse to offer other than that they returned to their old environment. This same type of patient would, after eight or ten years of addiction, give weakness or discomfort as an additional reason for their later relapses. Some intelligent psychopaths said they returned to narcotics to get relief from the blues that followed certain difficulties. One highly unstable professional man brooded over the failure he had made of life because of narcotics and traced his final relapse to this brooding.

"The frankness of the psychopathic characters contrasted markedly with the evasiveness and self-pity of those who had frank neuroses, and with the complaining attitude of certain temperamental cases. The physical necessity for narcotics loomed large in the minds of the latter. They seized upon any remembered discomfort as an excuse for relapse; a healed wound, a leg broken twenty years ago, a mild hemorrhoidal tendency, an old cured neuritis, and other conditions from which they received no discomfort while taking an opiate were credited with causing pain when the drug was withdrawn.

"Ten per cent. of the entire number of addicts in this series of cases got under the influence of liquor and took the first dose of narcotics while their inhibitions and judgment were lowered—but only a few of them blamed alcohol. Alcoholic dissipation was apparently a deliberate first step in their relapse, taken in order to give them courage to throw their good resolutions overboard and return to opium.

"The medical cases that were considered to be nervously normal attributed their early relapses to the return of the more or less painful physical conditions for which they first took narcotics, and the later ones to this same cause or to weakness and inability to work when not taking the drug."

As to the physical reasons for relapse, Kolb reports as follows:

"Opium, unlike alcohol, does not cause, so far as known, any destruction of tissue or permanent protoplasmic change. It does, however, bring about some very obvious functional changes. These result from the efforts of the body cells to adjust themselves to a drug, the normal effect of which is to inhibit cellular and glandular activity so that when the adjustment is made the cells and organs, though bathed in the drug, perform most of their functions in a degree approximating normality. This functional adjustment becomes strikingly evident when the drug, after having been used continuously over a prolonged period, is suddenly withdrawn. The inhibiting influence having been removed there is an increased functional activity of practically all organs and tissue and the nervous system, being suddenly relieved of a benumbing influence under which it has learned to record impressions with normal intensity, becomes hypersensitive. More numerous and more intense impressions are therefore sent by the tissues and organs to a nervous system, which, because of its hypersensitiveness, records them with magnified intensity. The net result is the withdrawal symptoms, some of which are very distressing. Collapse which sometimes occurs is probably due to an excessive relaxation of vasomotor control due to sudden removal of the artificial check under which the system has been functioning.

"Nearly every addict in this series of cases discontinued one or more treatments upon which they had ventured before the opiate they had been taking was completely withdrawn, or they returned to the drug a few days later. These abortive attempts are not classed as relapses, but failures of treatment. Such failures were due mainly to the acute physical symptoms accompanying withdrawal and to the unfavorable mental reaction resulting from them.

"The various types of addicts reacted with different degrees of intensity of physical symptoms, the objective evidence of which was similar. Intelligent persons with outstanding temperamental traits complained more than any others, the purely neurotic and the dull neurotic came next, while the psychopaths complained least of all."

* * * * *

"The acuteness of the intellect of the temperamental persons and their natural disgust or distaste for disagreeable things, caused them to exaggerate the importance of physical symptoms as it caused them to exaggerate the every day trifles and inconveniences of life out of all proportion to their significance. There may be some physical reason, in addition to their natural sensitiveness, why temperamental and neurotic addicts suffered more than the others. In any event, it was observed that the complaints of normal persons under treatment were adequate to the situation, and the temperamental addicts who showed few objective signs of suffering whined bitterly, while many of the psychopaths who had made up their minds to undergo treatment complained very little even though they vomited, had dilated pupils and showed other signs of distress. The temperamental addicts who gave up treatment before complete withdrawal was accomplished, did so because of the discomfort which they were unwilling to endure, while the psychopaths merely changed their minds. The depression that resulted from the whole physical situation and the lack of the soothing effect of narcotics on their normal mental unrest gave them a different outlook on the world, and in this state, they came to the conclusion that cure was not worth while. Some of them went through with the treatment, however, seemingly to save their faces; they remained in the hospital until the acute physical suffering was over and then left for the purpose of getting narcotics."

* * * * *

"The acute symptoms that contributed so much toward failures of treatment had very little to do with relapses that occurred two weeks or more after the opiate had been withdrawn. Almost without exception, the early cases felt comfortable and began to gain weight before the end of this period, but slight insomnia and mild restlessness often persisted for several weeks longer and in some there was an indefinite feeling, probably largely physical in nature, that something was missing. Many also experienced a greater fatigability than had been usual with them, but, as a rule, the early cases said that they had no physical desire or necessity for the drug within two weeks after it was withdrawn. In some instances this attitude was probably an expression of forced optimism. In any event there was in many of these cases some slight physical reason for relapse for as long as two months. These reasons were not in any way compelling, but they added something to the various factors that impelled the unstable to give up the struggle for cure.

"The acute stages of glandular and nervous overfunctioning resulting from the withdrawal of opium are also quickly over in long-standing cases of addiction, but in some of these it requires months of abstinence from the drug before all of the body functions return to normal. For the first few weeks after withdrawal of the drug these addicts, although they begin to gain in weight, may have occasional mild pains in the legs and uncomfortable sensations in the abdomen. They are very sensitive to cold and the men at first suffer with excessive seminal emissions which they think weakens them. A feeling of languor and loss of 'pep' is very common and many of them get discouraged because of it. If discharged from the hospital during this period the difficulties that they encounter on the outside accentuates their weakness and discontent and prompts them to seek relief in drugs again. Yet many of the patients in this series passed through this critical period outside of institutions and relapsed months later for reasons altogether foreign to the withdrawal symptoms. But in some of the long-standing cases, particularly among the more nervous, there remained fatigability, periodic diarrhea, palpitation of the heart, restlessness and distressing insomnia. Complaints of lack of energy and undue fatigue were very frequent, and some who had been addicted ten or more years claimed that this condition lasted for from six to nine months after cure and was the chief reason for their relapse. 'I never had any "pep" until I took the drug again,' was a common statement. Attempts to justify their relapse doubtless caused some to exaggerate the importance of this symptom, but it was so commonly complained of and it bears such a close relation to other symptoms that could be explained by loss of vasomotor tone that it may be considered to be present to a certain extent in a large proportion of cases. A feeling that they would 'fly to pieces' was experienced by some of the more nervous types who were deprived of the drug after taking it fifteen years or more. In a few instances the nervous symptoms were so grave as to make a return to narcotics advisable. . . .

* * * * *

"That the nervous manifestations following the withdrawal of opium are as a rule only temporary, even though the drug has been used for long periods, is shown by the fact that cases are cured after many years of continued addiction. In this series there are some physicians who were cured after twenty years and one after forty years' indulgence, but there was nothing abnormal in their original make-up. The reason for their previous relapses was the lack of sufficient motive to impel them to neglect their work until the withdrawal symptoms had so far subsided as to enable them to pursue it again. The narcotic division by threatening prosecution provided them with the motive they needed. The forty years addict was sixty-five years of age—he was slightly restless at times, but in no way uncomfortable after nine months of abstinence. Another physician not included in this series, because he never relapsed, took 25 grains of morphine daily for most of eighteen years. On five different occasions he tried to treat himself at home by gradually reducing the drug but failed because he would not give up his work in order to do it. Finally he took a cure through the urging of the narcotic inspectors. Insomnia was distressing for about two months and in addition there was for five months some painful bladder condition that he attributed to the medicine given during the course of treatment. He, however, never thought of returning to morphine to relieve this condition and one year after the original treatment he was a perfect specimen of health. These two cases illustrate that for several months after the withdrawal of opium normal addicts do have some symptoms that could be used as an excuse to return to the drugs but that they do not do so when the motive for cure is greater than the motive for relapse.

"The motive as well as the desire for cure in many abnormal persons is as great as in normal persons but the motive for relapse is so much greater that the cure motive is less likely to gain a permanent ascendency over it. The motive for relapse is in some of its phases continuous and is subject to exacerbation. This is why certain unstable persons relapse months after all physical reasons for it have disappeared.

"Psychic Reasons Given for Relapse

"It has already been intimated that in most cases the fundamental basis for relapse is to be found in the faulty mental make-up of the individual addicts and that the cause for addiction and the cause for relapse are in their most important phases basically the same.

"The unstable individuals who constitute the vast majority of addicts in the United States may be divided into two general classes: Those having an inebriate type of personality, and those afflicted with other forms of nervous instability. The various types find relief in narcotics. The mechanism by which this is brought about differs in some respects in the different types but the motive that prompts them to take narcotics is in all cases essentially the same. The neurotic and the psychopath receive from narcotics a pleasurable sense of relief from the realities of life that normal persons do not receive because life is no special burden to them. The first few doses, especially if larger than the average medicinal doses, may cause nausea and other symptoms of discomfort, but in the unstable there is also produced a feeling of peace and calm to which they are not accustomed and which, because of its contrast with their usual restless and dissatisfied state of mind, is interpreted as pleasure. These people have in their normal state unusual impulses and disturbing mental conflicts because of them. They feel inadequate or inferior, their usual restlessness and anti-social conduct are expressions of compensatory strivings against this, or specific acts may be pathological outlets for impulses not properly directed. The narcotic properties of morphine and heroin are sufficient for the time being to remove all of this. Inferiority is replaced by confidence, restlessness by calm, and discontent by contentment. The degree of contrast with their usual selves is in direct proportion to their degree of deviation from the normal.

"The pleasure derived from opium varies from a slight feeling of calm in persons who approximate normal in their nervous constitution to feelings sometimes approaching ecstasy in the extremely psychopathic. The greater susceptibility to addiction of the more abnormal cases is thus explained. The personality survey and clinical study of the 210 cases that form the basis of this paper shows that their nervous abnormality is the most important cause for the frequent relapse of addicts of the present day. In the psychopaths who make up the larger proportion of them, the pleasurable effect of opium was dulled by the increased tolerance consequent upon excessive indulgence in it and beclouded by the discomfort and uneasiness of their situation. With benumbing of pleasure and increase of discomfort a point was finally reached where they sought release from the distress of their new situation. By resort to cure they would get rid of the physical discomfort and the inconvenience of addiction and improve physically as well as socially for a time, but with cure and the passing of their newly acquired troubles, their former restlessness and discontent returned and sooner or later they sought relief for this by resorting to narcotics again. This cycle of events was repeated time and again in some cases, the final result as to relapse being more certain as the other contributing factors (physical dependence and memory associations) grew in importance with the duration of addiction.

"A very large proportion of these addicts deliberately addicted themselves with full knowledge of the difficulties incident to a life of addiction. Many of them had been social problems before they became addicted and the make-up of others was such as to insure that a large proportion would have run contrary to established social customs in some serious way even if they had not become addicts. By inference, then, it may be assumed that such cases relapse for the same reason that they become addicted. The inference is not so clear in the case of certain socially acceptable persons of normal or superior intellect who become addicts. These are temperamental or very neurotic persons, some of whom are highly useful or gifted citizens. Opium gives them a feeling of relief or contentment far in excess of that experienced by the average normal persons who because of illness are occasionally compelled to take it. The first few doses usually are taken for legitimate purposes, but, as with the psychopaths, the drugs also give such persons a pleasurable sense of calm that impels them to continue the drug—often in ignorance of the danger, sometimes in spite of it, until they become addicted. When such cases finally try to free themselves of the drug, the memory of the relief that it gave them from the underlying unrest of which their peculiar traits or symptoms are an expression, is a serious handicap in their struggle to do without it. As before stated, these people also exaggerate the ordinary difficulties of life more than do average normal persons and they register physical discomfort and pain much more acutely. It thus happens that some very useful and even gifted citizens have tried without success to be cured of drug addiction because of the force of the seductive calm that opiates gave them and because the discomfort of withdrawal seemed to them to be unbearable."

The influence of memory association and habit the author discusses as follows:

"In addition to the important etiological factors incident to the type of person who becomes addicted in the first place and the complicating physical symptoms which follow the use of opium over long periods of time, the taking of the drug results in the formation of numerous memory associations which are themselves potent reasons for continuing the drug or bringing about relapse. In this sense, opium addiction is a real habit. It is a common observation that no man lightly gives up anything to which he has accustomed himself. We see this plainly exemplified in the cured tobacco smoker who relapses after a period of abstinence and feels great relief in doing so. A cured smoker who usually does not crave tobacco may feel an intense desire resembling hunger when he gazes upon a box of cigars or sits in the company of friends who are smoking. The genesis of this desire is apparently wholly mental. The craving is due to memory associations and the habit the smoker has acquired of releasing a certain amount of energy by smoking when placed in certain environments. If smoking is indulged in, the aroused but pent-up energy flows smoothly into an accustomed channel, the tension is relieved and relief is obtained. Habitual indulgence in opium creates memory associations similar to those connected with the use of tobacco and adds some of its own. The craving that some cured addicts experience after the state of physical discomfort is over, and the 'hankering' for the drug that they speak of, is due largely to these memory associations. The impelling force of habit and the satisfaction derived from gratifying it, is seen in the morphine or heroin addict, who, when deprived of his customary drug, stabs himself with needles or safety pins, so-called 'needle-addiction.'

"The addict relieves himself of oncoming discomfort several times each day by taking a hypodermic of morphine or heroin. Due to difficulty in obtaining opiates he is often in actual pain before securing relief, and he worries a great deal about his source of supply. There is thus formed a strong association between distress, both physical and mental, and taking the drug. After a cure the first disappointment or illness he suffers brings forcibly to his mind the method of relief he has learned so well. The impulse to resort to it is strong and the stock from which addicts are recruited insures that resistance to it will be weak. We see this cause illustrated in an addict who said, 'The winter came on, I was cold all of the time and could not stand it without the drug . . .' and in the one who suffered a mild attack of influenza and gave as his reason for relapse that he was weak and had to boost himself with the drug. It is chiefly memory associations that cause many cured cases to feel discouraged and have the 'blues' on a rainy day.

"The return of addicts, especially of the unstable type, to their old environment adds greatly to the danger of relapse. Recently cured cases are restless, they as a rule are without employment and they naturally turn for company and diversion to their old companions among whom there are usually some addicts.

Nearly all of those who have abstained from narcotics for several months report that they have no desire for the drugs unless they see some one else take them or unless they associate with other addicts in situations which they formerly enjoyed. By arousing memory associations this unfavorable environment creates a craving that the unstable cured cases seldom resist for any great length of time. The power of memory association is illustrated by the case of a patient who voluntarily stayed two months in the hospital and was off the drug five weeks of that time. He thought daily of certain former associates with whom he had been accustomed to take morphine. He complained that he could not get the subject off his mind and that it kept alive his craving. A small party in which he formerly played poker and took morphine with a few friends, was reenacted several times in his dreams. The result was that the intense desire continued after the physical discomfort had passed.

"It was noted in other types of cured addicts, as well as the cured inebriates, that any frustrated desire or unsatisfied longing was transformed into a desire for narcotics. Some had a craving for narcotics when they were hungry, and others when they wanted to smoke. The craving would be completely relieved by food or tobacco. In some, certain unsatisfied social impulses were directed into the narcotic channel. The craving produced by social longing is more serious than that which is purely physical in origin because it is not so easily appeased. The longing for companionship, for the good will of others, the desire for a position the salary from which would insure the ordinary comforts of life and relieve financial worry, would, when frustrated be directed into the channel that experience had shown would resolve all longings by dulling the faculties that gave rise to them. The cured addict is advised to abandon his old associates, but he too often has no others who look upon him with understanding sympathy. When this is the case, he inevitably gravitates back to them to relieve the tension of his social impulses. This, in itself, is good for him, but the environment arouses memory associations connected with the use of narcotics and affords opportunity to return to them when his resistance is weakened. Without a social environment that satisfies certain emotional impulses and an occupation that diverts the mind while it absorbs the physical energy that is seeking for an avenue of expression, the continued abstinence from narcotics by a former addict is extremely difficult.

"Relapse was precipitated in some cases of this series by emotional disturbances incident to financial difficulties that could only be made worse by the return to narcotics; by the nagging influence of a suspicious wife, who, to protect her husband from relapse, watched every move he made; by a loss of position, by a deserved rebuke, and by other seemingly inadequate causes. One man, abstinent for ten years, relapsed because of an injury that kept him in bed for a week. Such relapses, of course, occur in unstable persons, who are in constant danger of falling under the depressing influence of some cause that would impel them to seek relief in narcotics. They know that the remedy will in the end increase that difficulty, but for the time being the relief promised overshadows, in importance, all other considerations.

"In addition to the various pathological strivings and impelling memory associations that act independently of the patient's will to bring about a resumption of the use of narcotics, some account has to be taken of the pleasurable physical thrill that large doses of these drugs give to certain addicts. This thrill has been discussed in another paper. It is sufficient here to say that striving for a repetition of it causes some psychopaths to inject narcotics directly into their veins, and its intensity may be judged by the fact that a few of them link it with sexual feeling. Some of these cases seem to return to narcotics purely for the physical pleasure the drugs give them aside from a negative feeling of mental relief that is also obtained.

* * * * *

"SUMMARY

"The relapse of drug addicts is mainly due to the same cause that is responsible for their original addiction, namely, a pathological nervous constitution with its inferiorities, pathological strivings, etc., from which narcotics give an unusual sense of relief and ease.

"The inebriate impulse is one of the most important causes of relapse.

"Relapse is more common than formerly because the addiction of more normal and therefore more easily curable persons is less common.

"Nearly all addicts make sincere efforts to be cured during the early period of their addiction. Many of the cures taken later on are mere matters of expediency and are insincere in effort.

"The hope for cure wanes as time passes and the force of habit, numerous impelling memory associations, and increasing physical dependence upon opiates is added to the original nervous pathology.

"Physical dependence upon opiates is unimportant as a cause for relapse during the first two or three years of addiction in those addicts who have been off the drug for two weeks or more.

"In some very nervous persons who have been addicted to an opiate for many years, withdrawal of the drug may produce hysterical symptoms or hypomania lasting several months."

Résumé

The most apparent conclusion to be reached from the material reviewed is that, for the most part, the treatment of this condition has not emerged from the stage of empiricism. The various methods described in general indicate that the basis of the majority of them is merely the separation of the patient from the drug. Very few of those who have described the details of treatment have given a rationale for their procedures, but rather have outlined dogmatically the adoption of certain measures, whose primary object is the withdrawal of the drug and have stated or left the reader to infer that the completion of the procedure brings about cure.

If the separation of the patient from the drug is all that is signified by "cure," it is evident that the *modus operandi* and the underlying rationale mean little or nothing and it is readily understood how any treatment with this object in view may result in "cure." The word "cure" should imply the return of the patient, insofar as is possible, to somatic and psychic integrity. In the literature dealing with treatment there is little to indicate that this desirable state of affairs commonly is accomplished.

In a few instances, however, the authors have developed their procedures in accordance with definite concepts of the morbid changes involved; they have pointed out the wide individual variations of physical and mental reactions both to the chronic poisoning and to therapeutic measures, and whether right or wrong in their conceptions of mechanism their claims deserve serious study and careful evaluation.

For the present, therefore, in view of the many unsettled questions as to the mechanism involved in this condition, it would seem more desirable to employ tentatively methods of treatment that appear to be based on such pathologic changes as are at present recognized in individual cases than to advocate, as too often has been done in the past, the employment of arbitrary procedures for general application.

CHAPTER X

CONTROL—INTERNATIONAL

With the growth in the demand for opium and its derivatives and the ever increasing evidence of the results of their chronic use among all classes, the need for group relief became apparent and first took the form of voluntary or enforced treatment of individuals in public or semi-public institutions. The inadequacy of public provisions for these cases, however, as well as the impermanence of the relief afforded soon became apparent and it was realized that measures directed at the prevention of the unwise distribution and use of the drug were prerequisite to any effective handling of the situation. This conviction was first expressed in the earliest state and municipal efforts at control through legislation.

Following the efforts of the various states and other political divisions, Congress became awakened to the needs of the situation and initiated the first international and national regulatory measures.

The first international effort at the solution of the opium problem was manifested in the deliberations and actions of the International Opium Commission which convened at Shanghai, February 1, 1909, and adjourned on February 27th of the same year. This Conference was called on the initiative of the United States whose invitation was accepted by Austria-Hungary, China, France, Germany, Great Britain, Italy, Japan, the Netherlands, Persia, Portugal, Russia and Siam.

Before 1909, treaties had been signed and agreements had been made between individual nations looking to a satisfactory adjustment of the needs of the situation existing at a given time in relation to the nations involved; but no concerted action by all of the nations had yet been taken when the International Opium Commission, recognizing the presence of a world problem, in 1909, endeavored to take a step forward in its solution.

It is not the object of the present study to review the historical background of the development of the opium problem or to analyse the various internal factors entering into the creation of a serious national situation in the individual countries of the world. Such a study would be of great interest; but, in order to offer a valuable contribution on what we may term the universal opium problem, it would involve the employment of time and facilities which are not at our disposal. In fact we seriously question the prudence of interpretation of even superficial features of the opium situation in certain countries without a very careful scrutiny of the facts in their relation to the racial, economic, sociologic, and other history of the peoples concerned. The enormity of such a task is patent but its significance is perhaps too often lost sight of by those who in their zeal for reform have made ill-considered and unwarranted attacks on the customs and policies of other nations.

Inasmuch as we are concerned here with the opium problem only as it exists in the United States, we shall confine the material submitted on the international situation to that which involves this country.

From Dr. Hamilton Wright,[1] who has published a very detailed outline of some of the international aspects of the opium problem to 1912, we learn that prior to the Shanghai Conference in 1909, the United States had taken an active interest in the traffic in opium beyond its borders. As early as 1833 a treaty was contracted with Siam forbidding Americans from engaging in the opium traffic with the Siamese. This was followed by another with Siam in 1856, according to which Americans could import and sell only to the opium farmer or his agents. Mr. Wright reports that "so far as it can be learned this was not against the wishes of the Siamese Government" for their revenue was derived in part from the farming out of the sale of opium.

Four treaties with China mark the early attitudes of the United States towards the opium traffic in that country. The treaty of Wang Hea, 1844, forbade American citizens from trading in opium in that country, making violators subject to be dealt with by the Chinese government. According to Wright, in our next treaty with China—the Tientsin Treaty of 1858—the official position of the American Government relaxed and Americans were free to engage in the opium traffic. However, by the American-Chinese commercial treaty of 1880, "a pact was entered into which forbade American citizens from engaging in the importation of opium into any of the open ports of China or to transport it from one open port to another open port, to buy and sell opium in any of the open ports of China. Chinese subjects were also prohibited from importing opium into any of the ports of the United States." According to the last treaty,—"Treaty of Commercial Relations"—1903, the importation into China and also the manufacture in China of morphia and instruments for its injection, except for medicinal purposes and on payment of a tariff duty, were prohibited.

---

[1] Wright, Hamilton. The International Opium Commission. Amer. Jour. Internat. Law. July and October, 1909.

By the treaty of amity and commerce of 1858 with Japan the importation of opium into Japan by Americans was prohibited.

Conditions in the Philippines when the United States assumed control were found to be serious enough for this country to undertake a thorough investigation of the opium problem throughout the Far East. The commission for the study was named in 1903 and its report led to the total prohibition of the importation of opium into the Philippines except for medicinal purposes. This legislation went into effect in 1908.

According to Wright, the report of the Philippines Opium Commission aroused afresh the world's interest in the problem and in 1906 Bishop Charles H. Brent, who had been a member of the commission and since the publication of the report had been closely watching the opium problem in the Far East, wrote to President Roosevelt calling his attention to the new movement against opium. Wright says:

> "In that letter he suggested that the moment was opportune, considering her interests in the Philippines and the stand she had taken there, for the United States to call for some international action in regard to the opium traffic. The matter was promptly taken up by the State Department, and on the 17th of October, 1906, the American Ambassador to Great Britain informed Sir Edward Grey that—
>
> " 'The American Government was much concerned with regard to the question of opium which had been raised in connection with the Philippines, and that he was instructed to ask me what view we should take for a commission for the joint investigation of the opium trade and the opium habit in the Far East, to be undertaken by the United States, Great Britain, France, the Netherlands, Germany, China, and Japan—that is, by those countries having territorial possessions in the Far East.'[2]

---

[2] China, No. 1, 1908.

"Sir Edward Grey replied that he could not tell him at once, but that, though an interference with the import of opium into China would involve a great sacrifice of Indian revenue, that would not prevent the Government from considering the question or imposing some sacrifice if it was clearly proved that the result would be to diminish the opium habit. The Chinese were understood to contemplate measures for stopping or restricting the importation of opium in China, and if they were really to be taken it would be a thing which Great Britain should encourage. After considerable diplomatic correspondence the above-mentioned Governments signified their willingness to join the United States in a joint investigation of the opium problem, and January 1, 1909, was appointed as a date for the meeting of the international commission at Shanghai."

The three commissioners appointed to represent the United States were Bishop Charles H. Brent, Dr. Hamilton Wright and Dr. Charles D. Tenney.

Wright continues:

"The original idea was that the opium traffic and habit as it existed in the Far East was to be investigated. But during the passage of the diplomatic correspondence it developed that the opium habit was no longer confined to Far Eastern countries, and that the United States especially had become contaminated through the presence of a large Chinese population. Further, that the morphine habit was rapidly spreading over the world. It was also seen that as Turkey and Persia were large producers of opium it would be necessary to invite them into the commission if the subject was to be thoroughly ventilated. Portugal was also a factor in the situation, through the possession of her colony of Macao, on the China coast, where considerable quantities of crude opium were annually imported from India, converted into smoking opium, and shipped to United States, Canada, and Mexico. Siam, though having no treaty relations with China, was nevertheless a factor in the problem on account of her long established government monopoly for the manufacture and distribution of smoking opium; Russia also, because of her contiguity in China. Although neither Austria-Hungary nor Italy had territorial possessions, except concessions in the Far East, yet it was thought desirable that they should enter the commission. Upon the development of the fact (as the result of the work of the American Opium Commission in 1908) that the opium question was no longer a question concerning oriental peoples, it was decided to widen the scope of the work of the commission so that it should include reports on the home States of various countries concerned, as well as on their territories and possessions in the Far East. This program was notified to the various countries concerned in July, 1908, and they were asked to have a report prepared on the opium question as it affected the home States as well as their Far Eastern possessions, so that it might promptly be laid before the commission as a whole when it met at Shanghai. As a result of the broadening of the scope of the international commission, Austria-Hungary, Italy, Siam, Persia, Turkey, and Portugal were invited into the Commission. Turkey failed to send a representative, but, in all 13 nations were represented at Shanghai when the commission met. Owing to the death of the Empress

Dowager and the Emperor of Japan the commission was postponed to the 1st of February, 1909."

The official report[3] of the commission states that a thorough study of the opium question was made by the commission and before adjourning on the 26th of February, 1909, it unanimously adopted the following resolutions:

"Be it resolved:

"1. That the International Opium Commission recognizes the unswerving sincerity of the Government of China in their efforts to eradicate the production and consumption of opium throughout the Empire; the increasing body of public opinion among their own subjects by which these efforts are being supported; and the real, though unequal, progress already made in a task which is one of the greatest magnitude.

"2. That in view of the action taken by the Government of China in suppressing the practice of opium smoking, and by other Governments to the same end, the International Opium Commission recommends that each delegation concerned move its own Government to take measures for the gradual suppression of the practice of opium smoking in its own territories and possession, with due regard to the varying circumstances of each country concerned.

"3. That the International Opium Commission finds that the use of opium in any form otherwise than for medical purposes is held by almost every participating country to be a matter for prohibition or for careful regulation; and that each country in the administration of its system of regulation purports to be aiming, as opportunity offers, at progressively increasing stringency. In recording these conclusions the International Opium Commission recognizes the wide variations between the conditions prevailing in the different countries, but it would urge on the attention of the Governments concerned the desirability of a reexamination of their systems of regulation in the light of the experience of other countries dealing with the same problem.

"4. That the International Opium Commission finds that each Government represented has strict laws which are aimed directly or indirectly to prevent the smuggling of opium, its alkaloids, derivatives, and preparations into their respective territories; in the judgment of the International Opium Commission it is also the duty of all countries to adopt reasonable measures to prevent at ports of departure the shipment of opium, its alkaloids, derivatives, and preparations, to any country which prohibits the entry of any opium, its alkaloids, derivatives, and preparations.

"5. That the International Opium Commission finds that the unrestricted manufacture, sale, and distribution of morphine already constitute a grave danger, and that the morphine habit shows signs of spreading; the International Opium Commission therefore desires to urge strongly on all governments that it is highly important that drastic measures should be taken by each government in its own territories and possessions to control the manufacture, sale, and distribution of this drug, and also of such other derivatives of opium as may appear on scientific inquiry to be liable to similar abuse and productive of like ill effects.

---

[3] Opium Problem. Message from the President of the United States transmitting . . . a report of the International Opium Commission . . . Senate Doc. No. 377. 61st Cong. 2nd Session.

"6. That as the International Opium Commission is not constituted in such a manner as to permit the investigation from a scientific point of view of anti-opium remedies and of the properties and effects of opium and its products, but deems such investigation to be of the highest importance, the International Opium Commission desires that each delegation shall recommend this branch of the subject to its own government for such action as that government may think necessary.

"7. That the International Opium Commission strongly urges all governments possessing concessions or settlements in China, which have not yet taken effective action toward the closing of opium divans in the said concessions and settlements, to take steps to that end as soon as they may deem it possible, on the lines already adopted by several governments.

"8. That the International Opium Commission recommends strongly that each delegation move its government to enter into negotiations with the Chinese Government with a view to effective and prompt measures being taken in the various foreign concessions and settlements in China for the prohibition of the trade and manufacture of such antiopium remedies as contain opium or its derivatives.

"9. That the International Opium Commission recommends that each delegation move its government to apply its pharmacy laws to its subjects in the consular districts, concessions, and settlements in China."

Wright comments as follows on the work of the commission:

"Looking broadly at the results achieved by the International Opium Commission, and considering that the United States has now proposed an international conference, this time with full powers to conventionalize the Shanghai resolutions and minor questions arising from them, it may be said that the International Opium Commission was a credit to this Government and a success, and that it will be recorded as the first great step taken by the powers together to put an end to an evil—no longer a Chinese or far eastern evil, but one that has made its appearance in and threatens the social fabric of many western nations."

The report continues:

"It has been stated above that, as the result of the unanimity of the international commission, as expressed in its resolutions, the way was opened to the United States to propose an international conference with full powers to complete the work of the Commission.

"Such a proposal was made by our Government on September 1, 1909. To those countries represented in the International Opium Commission was conveyed an expression of the satisfaction of our Government with the results achieved by the International Opium Commission.

"It was stated that this Government was deeply impressed by the gravity of the general opium problem and the desirability of divesting it of local and unwise agitation, as well as the necessity of maintaining it upon the basis of fact, as determined by the Shanghai commission. For this reason the United States considered it important that international effect and sanction should be given to the resolutions of the International Commission. To this end our Government proposed that an international conference be held at a convenient date, at The Hague or elsewhere, composed of one or more delegates of each of the participating powers, and that the delegates should have full powers to conventionalize the resolutions adopted at Shanghai and their necessary consequences. The Government of the United States suggested . . . a tentative programme based upon the resolutions and procedings of the international commission. . . ."

Wright describes the response to this circular as follows: [4]

"It is to the great credit of 11 of the powers to which this proposal was made that they promptly and heartily responded and offered to continue cooperation with the United States for final international settlement of the opium problem. By the middle of May, 1910, the American proposal had been almost generally accepted and the Netherlands Government had very courteously and quickly offered to assemble the conference at The Hague.

"However, one power had regretted its inability to send delegates to the conference, and another had failed to respond definitely to the American proposal by May, 1910, namely, Great Britain. There has been considerable ill-advised criticism of this delay on the part of the British Government, but the delay, as will be shown later, was due not to a want of sympathy or to a determination not to co-operate with the other Governments, but partly because Great Britain was then negotiating a modification of the 10-year agreement made between herself and China in 1907—it being the national desire of statesmen like Sir Edward Grey and Lord Morley that the opium question as between Great Britain and China should be advanced more nearly to the fulfillment of China's desires before the conference met. In addition to this, the British Government was greatly concerned over the morphine and cocaine traffic; for it had been shown beyond a doubt that immense quantities of these drugs were being smuggled into British India to take the place of opium, also that in China they tended to supplant the use of opium which the British Government had agreed that India should soon cease to export, and the production and use of which China on her part had agreed to suppress. But in September, one year after the American proposal was made, the British Government tendered its co-operation with the American and other Governments, laying down as a condition of its acceptance of the American proposal that the powers should agree before the conference met to study the question of the production of and traffic in morphine and cocaine, and pledge themselves beforehand to the principle of drastic legislation against such production and traffic equally effective with the measures she had taken or proposed to take for the ultimate obliteration of the Indo-Chinese opium trade.

---

[4] Wright, Hamilton—The International Opium Conference. Amer. Jour. of International Law. October, 1912, and January, 1913.

"Had the British proposals in regard to the morphine and cocaine traffics not been made, there is little doubt that the conference would have assembled early in 1911, but it was recognized by all concerned that though the British proposals were sound and necessary, they required the grave consideration of several of the Governments whose subjects were heavily interested in the manufacture of and traffic in these drugs. They were particularly important to Germany, as one of the largest producers. Nevertheless, after due consideration, all of the Governments accepted the British proposals, and the date of the assembling of the conference was finally fixed by the Netherlands for December 1, 1911. In the meantime the Italian Government has proposed that the production and traffic in the Indian hemp drugs be included as part of the program of the conference.

"It was stated above that the delegates to the International Opium Commission which met at Shanghai in February, 1909, felt on the whole that the conclusions of the commission as embodied in its resolutions would be only moral in their effect unless by subsequent agreement amongst the interested States the resolutions and their necessary consequences were converted to and given the force of international law and agreement. This, too, undoubtedly was the popular estimate of the work of the commission. Soon, however, this conclusion had to be modified, for within a few months from the adjournment of the commission several of the powers more particularly interested gave the resolutions of the commission a binding effect by legislating in accord with them. This was notably true of the British Indian Government, of the Governments of the British self-governing colonies, and of several of the Crown colonies; also of the French colonial governments. These actions were in accord with modern statecraft, which recognizes that moral conclusions unanimously arrived at by an authoritative international body of wide representation have nearly the force of distinct pledges entered into by a conference composed of delegates clothed with the full power of their States."

The American delegates to the Conference were Bishop Charles H. Brent, Hamilton Wright, and Henry J. Finger.

The official report[5] of the American delegation states:[6]

"The positive results of the conference may be stated as follows: Immediately after the adjournment of the International Opium Commission there were drafted in the Department of State two measures designed to control the foreign and interstate traffic in the United States of opium, morphine, and cocaine. When the conference assembled it was soon seen that the principles contained in those measures were principles that could be readily applied by an international conference to the international traffic in the commodities under consideration. It may be said, therefore, that the international opium convention as finally agreed upon is based in part on well-recognized principles, or proposed principles, of American interstate and navigation law. That part of the convention having to do with central governmental control of the drugs is based on the best European and Japanese practice, which on the whole is far in advance of the practice of our Federal Government.

---

[5] Second International Opium Conference. Senate Doc. 733. 62 Cong. 2nd Sess.

[6] See Appendix I for text of convention.

"A review of the convention will make this occult. Chapter I defines raw opium, and contains pledges on the part of the powers for the governance of the domestic and international traffic therein; Chapter II, of similar import, applies to opium prepared for smoking; and Chapter III to medicinal opium, morphine, and cocaine. Chapter IV, of five articles, is composed of pledges on the part of the treaty powers represented at the Conference aimed to assist China in suppressing her great and vexatious opium problem. Chapter V is composed of article 20 as to possible laws, and article 21 as to illegal possession of opium and as to the international exchange of documents and statistics. Chapter VI, of four articles, is composed of final provisions on supplementary signature, ratification, effectuation, and arbitration of the convention such as have never before been seen in an international document.

"The first paragraph of Chapter I gives a practical commercial definition of raw opium and fairly well conforms to the definitions of this substance as provided for many years in tariff legislation of the United States.

"By article I of the convention the contracting powers pledge themselves to enact effective laws or regulations to control the production and distribution of raw opium, unless their existing laws and regulations have already regulated the matter. That is, by this article the interested Governments must effectually bring under some sort of government supervision, either by the monopoly system as practiced in Japan, or by authorization of persons, the production and distribution of raw opium.

"By article 2 of the convention the contracting powers pledge themselves to restrict the number of cities, ports, and other places through which raw opium may be exported or imported. This article is in accord with American practice, for by virtue of the regulations issued by the Secretary of the Treasury, under authority of the opium-exclusion act approved February 9, 1909, the importation of opium into the United States is confined to 12 named ports. In practice, the effect of this article will be to secure a more strict governmental control of the importation and exportation of raw opium for medicinal purposes.

"Article 3 is one of the most important articles of the convention, in that it marks the formal adoption of a new principle of international commercial law, which, although in this case applied to opium, was recognized by all the delegates as applicable by future conferences to all commodities in international transit. By article 3 the contracting powers pledge themselves to take measures (a) to prevent the exportation of raw opium to countries which have or may prohibit its entry, and (b) to control the exportation of raw opium to countries which regulate or may regulate its importation. This article conventionalized resolution 4 of the International Opium Commission, which was pressed by the American Delegation and finally adopted by that commission. China had for

50 years or more contended against the exportation of Indian opium to China, frankly avowing first by protest and then by legalization of the traffic that she was unable wholly to prevent the inroad of the drug. That contention had been scorned by some of the greatest statesmen and economists of their day, the generally accepted view being that it was the business of a country prohibiting the entry of any drug or commodity to prevent its importation, an exporting country not being greatly concerned with the destination of the exported article.

"Upon the ratification by the various Governments of the present convention, by virtue of article 3, it will become an accepted principle of international commercial law that where a country has prohibited the importation of a drug or commodity it is the business of a producing country to prevent the exportation of such products to the prohibiting country, or to prevent the exportation of such products unless the exporter conforms to the importation regulations of a regulating country. All the delegates recognized that this principle—though by this convention specifically applied to the opium traffic—could nevertheless be made applicable to any obnoxious or dangerous commodity in international trade. The adoption of this principle is of great credit to those opium-producing countries vitally affected by it. As concerns the United States and its possessions, in which no opium of any amount is produced, it is of great practical value, and when it becomes effective will enable the preventive service of the customs effectually to exclude opium except for medicinal purposes, as provided for by the opium-exclusion act approved February 9, 1909, proposed legislation to strengthen that act, and Philippines legislation having the same object in view.

"By article 4 of the convention the contracting powers pledge themselves to enact legislation or issue regulations providing that every package containing raw opium intended for export shall be marked so as to indicate its contents, provided the shipment exceeds 5 kilograms. It was an object of the American delegation to secure that every package of opium for export should bear such marks. But as by Treasury regulation issued under the authority of the opium-exclusion act of February 9, 1909, delivery is made by the customs service of packages of opium containing not less than 100 pounds, it may be said that this article, as adopted by the Conference, marks a decided advance on American practice.

"By article 5 the contracting powers shall permit only duly authorized persons to import and export opium. In practice this will mean that all persons importing and exporting opium must first of all receive government authorization.

"Chapter II of the convention is of striking importance, as it provides for the obliteration in a short time of the manufacture, exportation, importation, and use of opium for smoking purposes, and, in the meantime, for the confining of such manufacture and use to territories where such manufacture and use now obtain by totally forbidding the export of this form of opium to countries which have prohibited its entry and use or to countries which propose in the future to prohibit its entry and use.

"The first paragraph of Chapter II defines the substance known as opium prepared for smoking, and by article 6 the contracting powers pledge themselves to take measures for the control, and ultimately effective suppression of the manufacture, domestic traffic in and use of this form of opium.

"When it is recalled that not 10 years ago there was a large and influential body of public officials and others here and abroad who saw no harm, economic, moral, or otherwise, to oriental peoples, in opium smoking, the importance of article 6 will be recognized. It marks the right-about of such opinion, and a recognition by the governments and peoples concerned that the opium smoking vice is generally degrading beyond all benefits to revenue that may accrue from the manufacture, importation, exportation, and use of this form of opium, and a determination on the part of those governments and peoples to bring the vice to a speedy conclusion.

"By article 7 the contracting powers pledge themselves to prohibit not only the importation of the smokable form of opium, but also its exportation—thus conforming to one of the principles embraced by the American opium exclusion act of February 9, 1909, and the proposed amendment thereto.

"By article 8 of the convention the contracting powers which are not yet ready to prohibit the exportation of opium prepared for smoking are pledged to restrict the number of places through which such opium may be exported; to prohibit its exportation to countries which now or hereafter may prohibit its importation; in the meantime to forbid the shipment of any prepared opium to a country that wishes to restrict its admission, unless the exporter complies with the regulations of the importing country; to take measures to have each parcel exported bear a special mark indicative of the nature of its contents and allow none but specially authorized persons to export this pernicious form of the drug.

"It might seem from a hasty reading of article 8 that a general international traffic in prepared opium is sanctioned. But such is not the case, for it should be borne in mind that where it had become necessary every country represented at the conference had prohibited the importation, and in some cases the exportation and use of this form of opium, and the colonies and possessions of all the countries except Portugal had passed strict laws forbidding the importation and in most cases the exportation of prepared opium. The notable instance of this not having been done is in the Portuguese colony of Macao on the China coast, where large quantities of this form of opium have been and are still manufactured both for use in the colony and for exportation—the object being colonial revenue. The great mass of this opium is intended for Chinese and other consumers in the United States, the Philippine Islands, Canada and Mexico. By the opium-exclusion act of February 9, 1909, the importation of this form of the drug into the United States is prohibited. The importation, manufacture, and use of it is prohibited in the Philippines.

"A recently enacted Canadian statute not only forbids the importation of this form of the drug, but its manufacture, transshipment or exportation. The Attorney General has held that under our opium-exclusion act of February 9, 1909, prepared opium may be imported into the United States for immediate transshipment by sea. Mexico has no law on the subject. The result is that the great mass of Macanise opium is brought to San Francisco and immediately transshipped by sea to western Mexican ports, from whence it, added to the direct Mexican import, is mostly smuggled into the United States across the Mexican border. Therefore, Portugal, at her colony of Macao, is the only country to-day which permits the export of this vicious form of opium, while the ports of all those countries parties to the convention are closed to it. The measures necessary to counteract and suppress this traffic to the United States are embodied in a proposed amendment to the opium-exclusion act of February 9, 1909, and will be adverted to later. It may be shown that if the Congress will enact the proposed amendment the international traffic in smoking opium will be practically wiped out.

"Chapter III of the convention is an important one and proved to be the most difficult to formulate of all the chapters of the convention except that one containing the final provisions. The traffic in raw opium and opium prepared for smoking had been thoroughly studied by the International Opium Commission at Shanghai and by the various national commissions appointed by the interested Governments before that Commission met, or which sat in the interval between the adjournment of the International Opium Commission and the assembling of the International Opium Conference. After the British Government made it a sine qua non that their participation in the International Opium Conference would depend upon the willingness of the interested Governments to pledge themselves to the same drastic legislation for the control of the production, manufacture, and trade in morphine and cocaine as in regard to opium, all the interested Governments willingly assented to this proposal when it was presented to them by the United States and the Netherlands Government on behalf of Great Britain. But a new factor was, nevertheless, injected into the problem and had to be met.

"The necessity for the British proposals had become obvious to all the Governments interested in the Far East; for, beginning with the suppression of the opium vice in China and other far eastern countries, a determined, and one almost might say a calculated, effort was made by the manufacturers of morphine and cocaine to introduce these drugs in replacement of opium. Such efforts had largely succeeded, and to the world was presented the spectacle of many great Governments willingly sacrificing or providing for the sacrifice of an aggregate annual opium revenue in the neighborhood of $100,000,000, only to see the subjects of some of them pressing two other deadly drugs into the hands of those far eastern people who had heroically determined and were bent upon the abandonment of the opium vice. The British proposals in regard to morphine and cocaine were eminently sound, practical, and essential, and it became the duty of the International Opium Conference to provide against the abuse of morphine and cocaine similarly as regarded opium.

"Chapter III of the convention is not by any means ideal, but represents a fair compromise of conflicting interests, and will no doubt be perfected by future conferences on the question. The first paragraph of Chapter III defines medicinal opium as opium that must contain not less than 10 per cent of morphine. This is superior to the tariff practice of the United States, which provides for the admission of medicinal opium containing not less than 9 per cent morphine, but it confirms the standard for medicinal opium set by the International Pharmaceutical Conference of 1906, to which the United States is a party. Morphine, cocaine, and heroin are also defined by this paragraph.

"By Article 9, Chapter III, the contracting powers pledge themselves to enact laws or regulations so as to restrict the manufacture, sale, and use of morphine and cocaine and their respective salts to medicinal and legitimate uses only, unless their existing laws and regulations already cover the matter. This article appertains to national legislation only, and it will be pointed out later that the United States is the most backward of all the western nations and almost strikingly behind Japan in this phase of legislation.

"Article 10, Chapter III, is weak in that the powers only pledge themselves 'to use their best efforts to control or cause to be controlled' those who manufacture, import, sell, distribute, or export morphine, cocaine, and their respective salts, and the buildings in which such persons carry on that industry or trade. The article then goes on to lay down the specific manner in which this object shall be accomplished.

"There was a willingness on the part of all the delegations to formulate this article as strictly as the articles dealing with raw opium and opium prepared for smoking. But there were certain constitutional difficulties in the way—notably in the case of Germany—and article 10 was a compromise based on the fact that Germany has extremely strict and effective National and State laws governing the question dealt with by article 10. This is also true of several of the other European countries represented in the conference, and certainly of Japan.

"By article 11 the contracting powers are to take measures to prohibit in their home trade any delivery of morphine, cocaine, and their respective salts to any but authorized persons, and by article 12 the importation of morphine and cocaine is restricted to persons authorized by the Government.

"What was said of article 10 may be said of article 13 where the contracting powers do not pledge themselves to adopt, but only to use their best efforts to adopt or cause to be adopted measures to prevent the exportation of the named drugs from their home territories, possessions, colonies, and leased territories to the countries, possessions, colonies and leased territories of the other contracting powers, and provides that each Government may communicate from time to time to the Governments of exporting countries the lists of persons to whom authorization or permits to import the named drugs shall have been granted. It was the hope of the American delegation that a distinct pledge be made by the interested Governments to enact legislation to prevent the exportation of these drugs except by authorized persons in one country to authorized importers in another. But it was not found possible to secure this.

"By article 14 the contracting powers pledge themselves to apply their laws and regulations governing the manufacture, importation, sale, and exportation of morphine, cocaine, and their respective salts to medicinal opium and to all preparations of opium containing not[7] more than 0.2 per cent. of morphine or more than 0.1 per cent of cocaine and heroin, and also to any new derivative of morphine and cocaine, or any other alkaloid of opium which might be shown by general scientific research to occasion similar abuses and result in like noxious effects. Article 14 again represents a compromise. The American and several other delegations pressed to have the exceptions in this article as to percentages of morphine, cocaine, and heroin deleted, but failed to accomplish their purpose.

---

[7] The word "not" is apparently a typographical error as it is not consonant with the evident meaning of article 14, Chapter III of the Convention.

"Chapter IV is composed of articles governing the opium traffic as it has obtained in the past between China and the nationals of several Governments represented. The interest of the United States in this chapter may be said to be important because it contains principles for which the Chinese Government and people long contended, principles which were supported by the United States in its first treaty (1844) with China, and by article 2 of the treaty of 1880 with China, which directly prohibit American citizens from entering into the Chinese foreign or coastwise traffic in opium. Chapter IV revolves somewhat on the agreements made between China and Great Britain; the so-called 10-year agreement of 1907 and the modification of that agreement, signed at Peking May 8, 1911.

"To make this clear the reader should refer to what has already been stated in regard to the so-called 10-year agreement between Great Britain and China of 1907, and to the modification of that agreement signed on May 8, 1911. By so doing it will be seen that the great leaders of the British Government—more particularly Sir Edward Grey, Lord Morley, Earl Crewe and Lord Minto as governor general of India had determined upon an agreement with China by which the Indo-Chinese opium traffic should be abolished pari passu with the suppression of the production of opium in China, and that thereby the British Government accepted the principle long maintained by the American Government in its treaties with China that the wishes of China in regard to the opium traffic should be met. It will be readily seen that the acceptance of Chapter IV of the International opium convention by the treaty powers represented at the conference broadens the comity between Great Britain and China, and will prevent any nation signatory to the convention taking unfair advantage of the special Anglo-Chinese agreement.

"To continue an outline of the International Opium Convention, it may be stated that by Chapter V, composed of two articles, the contracting powers agree to examine the possibility of enacting laws or regulations making the illegal possession of the drugs named in the convention liable to penalties unless existing laws or regulations have already done so; and they are to communicate to each other through the Netherlands ministry for foreign affairs the text of the laws and the administrative regulations which concern matters aimed at by the convention: also statistical information with respect to that which concerns the traffic covered by the convention.

"But especially attention should be directed to Chapter VI of the convention containing its final provisions. This chapter, composed of Articles 22, 23, 24 and 25, marks a radical departure from the final provisions as seen in any other international convention. It recognized the futility of an attempt on the part of a minority of the powers of the world to bring under control the international traffic in anything which may be produced or trafficked in by the nationals of any State, and would seem to have irretrievably determined that future international conferences, such as the International Opium Conference, must be composed of and its convention to be effective signed by an overwhelming majority of the States directly or indirectly interested. Nearly all international conventions similar to the opium convention heretofore signed have been signed by delegates of a comparatively small number of the major and minor States, and generally speaking, their final provisions have permitted of the adhesion of States not represented at the conference and have provided for ratification by the signatory powers in the shortest possible time—usually not to exceed two years.

"The international Opium Conference had no sooner assembled than certain of the delegations pointed out that it would be useless for those States represented in the conference, and who were the largest producers and traders in opium, morphine, cocaine, etc., to agree to radical measures for the international control of these drugs, so long as it was open to the nationals of those States not represented at the conference to continue or take up the production of and traffic in them.

"It was contended by the American delegation, and they were not alone in this contention, that the International Opium Conference was composed of nations representative of the civilized world; therefore that the delegates should pledge their governments to the convention, and that the ordinary form of adhesion and ratification should be adopted as the final provisions of the convention. The American delegation was urged to this contention by the belief that those governments interested and not represented at the conference would soon adhere to what had been signed, as they had many times adhered to other conventions to which they were not directly signatory. But this view was not favored by a majority of the delegations present, and the conference finally decided, as provided by Article 22 of the convention, that the powers not represented at the conference shall be permitted to sign the present convention, and that to this end the Netherlands Government shall invite immediately after the convention shall have been signed all the powers of Europe and of America not represented at the conference (and then is enumerated the 34 other powers of Europe and America) to designate a delegate armed with the full powers necessary for the signing of the convention at The Hague.

"Article 22 proceeds to provide that the convention shall be furnished with the signatures of the other powers by means of a 'Protocol of signature of powers not represented at the conference,' to be added after the signatures of the powers represented, and indicating the date of each signature; and that the Netherlands shall give a monthly notice to all the signatory powers of each supplementary signature.

"Article 23 provides that after all the powers as much for themselves as for their possessions, colonies, protectorates, and leased territories shall have signed the supplementary protocol of signatures, the Netherlands Government shall invite the powers to ratify the convention, together with the protocol of signature.

"In case the signature of all the powers invited shall not have been secured by December 31, 1912, the Netherlands Government shall immediately invite all the powers who have signed by that date to designate delegates to proceed to The Hague to examine into the possibility of nevertheless depositing their ratifications. Ratifications shall then be executed within as short a time as possible, and shall be deposited at once at The Hague in the ministry for foreign affairs. It is also provided that the Netherlands Government shall give notice to all the powers who shall have ratified the convention, and of the date on which the last of such acts of ratification shall have been received.

"By article 24 it is provided that the convention shall go into effect three months after the date on which the Netherlands Government gives notice of ratification to the powers, and again, that all laws, regulations and other measures provided for by the convention shall be drawn up not later than six months after the effectuation of the convention; it is further provided that these measures shall become operative subject to an agreement between the signatory powers at the instance of the Netherlands Government.

"It is important to notice that the last paragraph of article 24 provides that in case questions shall arise relative to the ratification of the convention for effectuation of the convention, or the effectuation of the laws, regulations, and measures which the convention involves, the Netherlands Government, if these questions shall not be decided by other means, shall invite all the signatory powers to designate delegates, who shall assemble at The Hague, to come to an immediate agreement on these questions. This is a novel feature, and, as it will be readily seen, practically provides for an arbitration at The Hague of any disputes growing out of the terms of the convention.

"Article 25 of the convention is common form, and contains the usual provisions for denunciation, for the deposit of the convention, and for the transmission of certified copies of it to the powers represented at the conference.

"It may be stated that the novel final provisions of the convention were designed because of the difficulties connected with its Chapter III concerning morphine and cocaine. Chapters I and II concerning the production and traffic in raw and prepared opium, and Chapter IV concerning China are composed of distinct pledges by the signatory powers made on questions on which there was little or no disagreement, and to which it was thought the powers not represented at the conference would readily adhere. Chapter III, on the other hand, deals with the question of the traffic in morphine and cocaine, on which there was disagreement considerable enough to compel certain of the delegations to hold that the chapter could not be effectuated by the signatory powers until it was subscribed to by the States not represented in the conference. Therefore, the novel final provisions were designed because of the difficulties connected with the contents of Chapter III, and the ratification of the entire convention must now wait upon the necessary supplementary signature of 34 other States.

"Toward the end of the conference, and with the object of escaping this dilemma, the American delegation proposed that the convention should be broken in two parts—one to be composed of Chapters I, II, IV and V, on the contents and strict pledges of which all the delegations were agreed, and to have as final articles the ordinary form of such articles in other conventions which provide for adhesion and ratification; the other convention to be composed of Chapters III and VI, the latter to contain the novel final articles as eventually adopted for the convention as it now stands. The American view, however, was not acceptable to a majority of the delegations, and therefore was not pressed.

"In addition to the convention, the delegates to the International Opium Conference signed a protocole de cloture, which contains the following views: That the conference is of the opinion that there is reason to draw the attention of the Universal Postal Union to the urgency of regulating the transmission by post of raw opium; to the necessity of regulating, as far as possible, the transmission by post of morphine and cocaine and their respective salts, and of the other substances contemplated by article 14 of the convention; to the necessity of prohibiting the transmission of prepared opium by post and of the advisability of the study of the question of the Indian hemp drugs from the statistical and scientific standpoint with a view to regulating their misuse should the necessity thereof make itself felt.

"Generally speaking, it may be said that the convention is satisfactory, and illustrates that the most powerful nations in the world are now agreed that an evil, such as the opium evil, is never wholly national in its incidence, can never be suppressed by two nations alone—as was supposed to be the case in regard to the Indo-Chinese opium traffic—but that such an evil as it appears in one State is a concomitant or reflex of a similar evil in other States and is, therefore, international in its moral, humanitarian, economic, and diplomatic effect, that this being so, few evils can be eradicated by national action alone; and, therefore, only by the cooperation of all the States, directly or indirectly interested, can such an evil be mitigated or suppressed.

"The convention marks a decided step in advance in the international movement for the suppression of the opium evil, initiated by the United States. This movement at first was thought to concern only those countries of the Far East or those western nations having territorial possessions in the Far East—five or six in number. But it has proceeded, by way of a sober international commission of inquiry, composed of commissioners representing 13 nations, and by a conference composed of delegates with full powers representing 12 of these nations. These delegates, having formulated and signed on behalf of their Governments a convention containing strict pledges for national legislation and international cooperation, the convention has now been presented to the remaining States of Europe and America—34 in number—for their signatures.

"But, quite apart from the contents of the convention itself, the international movement initiated by the United States has had a directly beneficial effect on the interested nations, for, as already related, pending the assembling and action of the international Opium Commission, and while the diplomatic correspondence aimed to secure The Hague conference was in progress many of the Governments concerned perfected domestic legislation for the suppression of the evils connected with opium and other narcotics, and took measures concerning the export of these drugs which were of international significance.

"By the final provisions of the convention contained in Chapter VI, there will probably be a delay of a year before the convention can be ratified by the signatory powers and those powers who agree to sign the protocol of supplementary signature. That, however, is of little moment compared to the new international comity which has been established by the document and the furtherance by it of new principles of international commercial law, while the deduction may be made from article 22 of the convention that all future Hague conferences dealing with matters of general international commerce must be composed of an overwhelming majority of the nations.

"There is, however, one aspect from which the convention may be viewed that should be disquieting to the Government and the people of the United States. It has just been stated that a reflex effect of the initiation by the United States of the international movement for the abatement of the opium evil took the form of improved domestic legislation in nearly all the countries concerned of very drastic legislation in some, while one country, at least—Great Britain—both by national and colonial law, effectuated resolution 4 of the International Opium Commission, as now embodied in Article 3 of the International Opium Convention.

"The one nation which has not been vitally affected by the international movement initiated by the United States is the United States itself, except in the Philippines. In the islands there are model antinarcotic laws; but, in spite of repeated urging by the Executive, the Congress so far has failed favorably to consider carefully drafted measures aimed to bring the continental United States into line and in accord with the principles now embraced by the International Opium Convention. A good beginning was made by the Federal Government, as may be seen by reference to the opium act approved February 9, 1909. This act is imperfect—the only effect which it could possibly have being to prevent the legal importation into the United States of the vicious form of opium known as opium prepared for smoking."

During the first Hague Conference an informal agreement was made between the Minister for Foreign Affairs of the Netherlands Government and the American delegates thereto that the United States should especially concern itself in securing to the convention the signatures of the Latin-American states, which according to Article 22 of the International Opium Convention, along with other powers not represented at that Conference, were to be invited to sign the instrument.

According to Article 23 of the International Opium Convention providing that "in case the signature of all the Powers invited shall not have been secured by December 31, 1912, the Netherlands Government shall immediately invite all the Powers who have signed by that date, to designate Delegates to proceed to The Hague to examine into the possibility of nevertheless depositing their ratification," the Second International Opium Conference was called for July 1, 1913, at The Hague.

After the opening formalities of the Conference it was announced that the following powers had signed the International Opium Convention:

"Germany, the United States of America, Argentina, Belgium, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Cuba, Denmark, Dominican Republic, Ecuador, Spain, France, Great Britain, Guatemala, Haiti, Holland, Honduras, Italy, Japan, Luxemburg, Mexico, Nicaragua, Panama, Paraguay, Persia, Portugal, Russia, Salvador, Siam, and Venezuela; that all were represented in the conference except Bolivia, Cuba, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Persia and Venezuela."

leaving Austria-Hungary, Bulgaria, Greece, Montenegro, Norway, Peru, Roumania, Servia, Sweden, Switzerland, Turkey, and Uruguay as having not signed. During the Conference Peru and Uruguay agreed to sign and ratify the Convention.

The official report of the Conference addressed to the Secretary of State, continues: [8]

"The immediate work before the conference was to decide whether the signatory powers represented were prepared to agree to a deposit of ratifications according to article 23 of the International Opium Convention. At the first session there was a tendency on the part of a majority of the representatives of the powers to proceed at once to that question. But on a plea from the American delegation that an informal discussion of other aspects of the International Opium Convention might lead to something more than a mere agreement to ratify, the conference adjourned for 24 hours to enable the delegations to consult with each other."

* * * * *

"By the 7th of July, as the result of almost continuous informal conference between the above-named representatives of Germany, the United States, France, Great Britain, the Netherlands, and Russia, and as the result of consultations between these representatives and the other delegations, the following project was presented to the conference for discussion:

"PROPOSED RESOLUTION PRESENTED BY THE DELEGATIONS OF GERMANY, UNITED STATES OF AMERICA, FRANCE, GREAT BRITAIN, THE NETHERLANDS, AND RUSSIA."

* * * * *

RESOLUTION

"Desirous of following up in the path opened by the international commission of Shanghai of 1909 and the first conference of 1912 at The Hague, the progressive suppression of the abuse of opium, morphine, cocaine, as well as of drugs prepared with or derived from those substances, and deeming it more than ever necessary and mutually advantageous to have an international agreement on that point, the Second International Conference—

"1. Utters a wish that the Government of the Netherlands be pleased to call to the attention of the Government of Austria-Hungary, Norway, and Sweden the fact that the signature ratification, drawing up of legislature measures and putting the convention into force constitute four distinct stages which permit of those powers giving their supplemental signature even now.

---

[8] Second International Conference. Senate Doc. No. 157. 63 Con. 1st Sess.

"Indeed, it is seen from article 23 and 24 that a period of six months is allowed to run between the going into effect of the convention and the drawing up of the bills, regulations, and other measures contemplated in the convention. Furthermore, the third paragraph of article 24 gives the contracting powers the liberty to reach an agreement, after ratification, upon the date on which the said legislative measures shall go into effect. Besides, we cannot refrain from remarking that the difficulties foreseen by Austria-Hungary, Norway, and Sweden with respect to their legislation were not unknown to the delegates of the signatory powers and were subjected to thorough consideration on the part of the twelve contracting powers. Nearly all the signatory powers are in the same situation as the above-mentioned Governments and have not yet elaborated all the bills contemplated by the convention.

"2. Utters the wish that the Government of the Netherlands be pleased to communicate to the Governments of Bulgaria, Greece, Montenegro, Peru, Roumania, Servia, Turkey, and Uruguay the following resolution:

"The conference regrets that some Governments have refused or neglected to sign the convention as yet. The conference is of opinion that the abstention of those powers would prove a most serious obstruction to the humane purposes aimed at by the convention. The conference expresses its firm hope that those powers will desist from their negative or dilatory attitude.

"3. Utters the wish that the Government of the Netherlands be pleased to point out to the Helvetic Government its error in deeming its cooperation to be of hardly any value. Contrary to what is said in the Federal Council's letter of October 25, 1912, the conference holds that Switzerland's cooperation would be most serviceable in its effect, whereas her abstention would jeopardize the results of the convention. As to the question raised by the Federal Council concerning the respective powers of the Federal and Canton Legislatures it is to be noted that similar difficulties were already considered by the first conference which took them into account in wording the convention.

"4. Requests the signatory Governments to instruct their representatives abroad to uphold the above-indicated action of their Netherland colleagues.

"5. Utters the wish that in case the signature of all the powers invited by virtue of paragraph 1 of article 23 shall not have been secured by the 31st of December, 1913, the Government of the Netherlands will immediately invite the signatory powers on that date to designate delegates to take up the question whether it is possible to put the International Opium Convention of January 23, 1912, into operation.

"This projet met with immediate favor, and was referred to a Comité de Rédaction, composed of Dr. Hamilton Wright of the American, Dr. C. Th. van Deventer of the Dutch, Sir William Collins of the British, and Baron Alberic Fallon of the Belgian delegation, for final revision. Such final revision was made with the invaluable assistance of His Excellency Monsieur van Swinderen, Netherlands minister for foreign affairs. On behalf of his Government Mr. Van

Swinderen expressed a willingness to see that the terms of the project were immediately laid before the 10 nonsignatory powers, the Dutch representative to those powers, as required by the project to be supported by the representatives of the signatory States at the capitals of the nonsignatory States.

"A roll call as to deposit of ratifications of the International Opium Conference was made, and all the powers represented immediately agreed to proceed to the deposit of ratifications except Great Britain, Germany and Portugal. The representatives of Great Britain and Germany made a very sympathetic statement in regard to, and put on record the entire agreement of their Governments with the International Opium Convention, but held that it was the desire of their Governments to see the signatures more particularly of Austria-Hungary, Switzerland, and Peru added to the convention before they should agree to their deposit of ratifications."

* * * * *

"The above-named projet of the five powers was embodied in a protocole de cloture of the conference and signed by representatives of the powers at the conference at 3 o'clock on July 9, thus bringing to a practical conclusion the five years of effort of the United States to secure comprehensive international action for the suppression of the abuses connected with the production and distribution of opium, morphine, cocaine, and other narcotic drugs. The conference was then adjourned sine die by the minister for foreign affairs of the Netherlands Government and the delegates proceeded to signature."

The result of the Conference in regard to signatures and ratifications may be seen in the following table:[9]

"Memorandum for the Secretary of State on the present status of the International Opium Convention signed at The Hague, January 23, 1912, and on agreement to deposit ratifications at The Hague, made July 9, 1913.

"The following powers have signed the convention:

"Germany[1]
United States[1]
Argentina[2]
Belgium[2]
Bolivia[2]
Brazil[2]
Chile[2]
China[1]
Colombia[2]
Costa Rica[2]
Cuba[2]
Denmark[2]
Dominican Republic[2]
Ecuador[2]
Spain[2]
France[1]
Great Britain[1]
Guatemala[2]
Haiti[2]
Honduras[2]
Italy[1]
Japan[1]
Luxemburg[2]
Mexico[2]
Nicaragua[2]
Panama[2]
Paraguay[2]
Netherlands[1]
Persia[1]
Portugal[1]
Peru[2]
Russia[1]
Salvador[2]
Siam[1]
Uruguay
Venezuela[1]

(Total, 36.)

[1] "Original signatories of the convention.

[2] "Supplementary signatures, in accordance with article 22 of the convention.

---

[9] Second International Opium Conference. Senate Doc. 733. 62 Cong. 2nd Sess.

"Of the foregoing nations, the following have agreed to deposit ratifications in accordance with article 23 of the convention:

‘United States
Argentina
Belgium
Brazil
Chile
China
Colombia
Costa Rica
Denmark
Dominican Republic
Ecuador
Spain
France
Haiti
Honduras
Italy
Japan
Luxemburg
Mexico
Netherlands
Russia
Siam
Guatemala
Nicaragua
Venezuela
Peru
Uruguay

(Total, 27.)

"The following signatory powers were represented at the conference, but reserved ratification until Austria-Hungary, Peru, and Switzerland have agreed to ratification. The chief difficulty of German ratification—Peru—has been removed. It was the general view of the conference that Austria-Hungary and Switzerland would sign and ratify in the near future, and that Great Britain would then agree to ratify. Portugal will undoubtedly agree to ratify.

Germany
Great Britain
Portugal.

"The following signatory powers did not have representatives at The Hague, but are expectant shortly to agree to deposit ratifications:

Bolivia
Cuba
Panama
Paraguay
Persia
Salvador

(Total, 6.)

"That is, the great majority of the signatories have agreed to ratify, and soon all signatories—36—will have agreed to ratify.

"The following countries have not signed the convention, but by direction of the recent conference will be pressed to do so by an identic note to be presented at their foreign offices by the Netherlands minister supported by the ministers of the powers represented in the conference:

Bulgaria
Greece
Turkey
Switzerland
Austria-Hungary
Norway
Sweden
Roumania
Montenegro
Servia

(Total, 10.)

"Note—All the powers who have signed and agreed to proceed to ratifications will do so without waiting upon the nonsignatory powers. It is expected by the Netherlands Government that all those nations which have agreed to ratify will have deposited their ratifications by December 31 next, and that before that date the most important of the nonsignatory powers will have adhered, thus enabling Great Britain and Germany to agree to ratification.

"Thus, as the result of five years' leadership on the part of the United States, an international convention imposing strict international, and requiring equally strict domestic laws, for the relegation of opium and allied narcotics to strictly medical channels has been signed in the greatest good will by all but ten nations of the world and agreement to ratify the instrument made by nearly all of the signatory powers. There is every reason to believe that by the end of the year, by the action of the recent conference, the entire world will be signatory to the convention, and that it will become universally effective a short time thereafter.

"Shortly before the assembling of the recent conference Great Britain showed her good will toward China and her good intentions in regard to the rest of the world by bringing to a close on the 7th of May last the Indo-Chinese opium traffic, which had officially existed between India and China since 1767, when Clive, general for the British East India Co., won the battle of Plassy.

"There are some who, from an apparently studied disregard of the facts, pretend to believe that this Government has accomplished nothing during the past five years by its leadership in this great movement. I feel that it is not improper to quote from a report on this question made by you to the President on the 21st of last April:

" 'This, Mr. President, is a movement which I have followed for the past six years, I have examined all the essential facts and documents relating thereto and have been gratified to review the growth of this humanitarian, moral, and economic movement from a consultation between this Government and five or six of the great powers of the world to one which now embraces the co-operation and has the sanction of almost the entire group of civilized States, and this in spite of the fact that it means past and future financial losses to the powers concerned of over $50,000,000 aggregate annual revenue. The entire movement illustrates a principle abroad in and stamped with the approval of the world to-day, namely, that the peoples are now agreed that an evil such as the opium evil is never wholly national in its incidence, can never be suppressed by two nations alone, as was supposed to be the case with the Far Eastern opium traffic, but that such an evil as it appears in one state is a concomitant or a reflex of a similar evil in other states, and therefore is international in its moral, humanitarian, economic and diplomatic effect; further, that few evils can be eradicated by national action alone, and therefore that there must be co-operation of all the states directly or indirectly interested before such an evil is mitigated or suppressed. This movement, in which the United States has taken so large a part, was thought at first to concern only those countries of the Far East, or those western nations having territorial possessions in the Far East—five or six in number. But it has proceeded by way of a sober international commission of inquiry composed of commissioners representing thirteen nations and by a conference composed of delegates with full powers representing 12 of these nations. Those delegates having formulated and signed on behalf of their Governments a convention containing strict pledges for national legislation and international co-operation, it was presented to the remaining States of Europe and America, 34 in number, for their signature.'

"As the above table will show, not only have the majority of the 34 signatures been secured, but nearly all of those who have signed agreed at the recent conference to proceed to ratification, while the recent conference put into operation the necessary diplomatic machinery for the securing of the remaining signatures and ratifications of the international convention.

"It remains for the United States to demonstrate the sincerity of its leadership in this movement by passing the necessary Federal legislation required by the terms of the convention. It is very gratifying to be able to state that the action of the House in unanimously passing the three antinarcotic bills approved by the President, yourself, and the Secretary of the Treasury, had a most beneficent effect on the recent conference, for it was regarded as a pledge that the Senate would shortly act on the legislation, and that the United States proposed to remain in the forefront of the humanitarian movement which it had inaugurated."

The following is the Final Protocol of the Second International Opium Conference—1913.[10]

"(Translation)

"The Second International Opium Conference, convoked by Government of the Netherlands in virtue of Article 23 of the International Opium Convention, met at The Hague, in the Palace of the Counts, July 1, 1913.

"The Governments enumerated below took part in the Conference, for which they had designated the following named delegates.

(Here follow names of Governments and delegates.)

"In a series of meetings held from the 1st to the 9th the conference after examination of the question put before it by paragraph 2 of Article 23 of the International Opium Convention of January 23, 1912.

"I. Decided that ratifications may be deposited from this moment.

"II. Unanimously adopted the following resolution:"

(Here follows the resolution previously quoted.)

"In faith whereof the delegates have affixed their signatures to the present protocol.

"Done at The Hague, the ninth of July, one thousand nine hundred and thirteen, in one copy that shall remain deposited in the archives of the Government of the Netherlands and certified copies of which shall be delivered through the diplomatic channel to all the powers, whether or not signatory.

(Here follow signatures.)"

The ratification of the International Opium Convention and Final Protocol was advised by the Senate of the United States on October 18, 1913, passed by the President on October 27, 1913, and deposited by the United States with the Netherlands Government December 10, 1913.

---

[10] Suppression of the Abuse of Opium and Other Drugs—Convention and Final Protocol between the United States and Other Powers—Treaty Series No. 612.—Washington: 1922.

On January 17, 1914, shortly after the ratification of the Hague Convention, an act was approved by the President of the United States, which, among other provisions, restricted the exportation of opium and its preparations, except smoking opium, the exportation of which was prohibited, to those countries regulating their importation under regulations prescribed by such countries. As will be noted in the section dealing with the national phases of the problem, where it is discussed in detail, this act attempts to meet the objects of The Hague Convention.

In accordance with Section III of the Final Protocol of the Second International Opium Conference July, 1913, which provided that "in case the signature of all the powers invited by virtue of paragraph 1 of article 23 shall not have been secured by the 31st of December, 1913, the Government of the Netherlands will immediately invite the signatory powers on that date to designate delegates to take up the question whether it is possible to put the International Opium Convention of January 23, 1912, into operation," a third conference was called.

The American delegates to the Third International Opium Conference were Dr. Henry Van Dyke and Charles Denby. In his letter of instruction to these delegates, after reviewing the situation to date, the Secretary of State states: [11]

> "Since the adjournment of the Conference of last July the American and the Netherlands Governments have made a united effort to secure for the Convention the signatures of the remaining non-signatory Powers, and have been successful except in the case of Austria-Hungary, Greece, Servia and Turkey.
>
> "It is assumed by the Department that the discussion and conclusions of the prospective Conference will, except by general consent of the interested Governments, be confined to the purpose of the Protocol signed at The Hague on July 9th last. Therefore, it is unnecessary to give you detailed instructions on this question. Should, however, other questions arise resulting from the anti-opium movement with its hearing on the treaties, you will be guided by the tenor of the Department's instruction of October 18, 1911, to the American Delegates to the International Opium Conference which met at The Hague on December 1st of that year.
>
> "You may agree to put the International Opium Convention into force on behalf of the Government of the United States.
>
> "One thing I wish you to bear in mind, namely, that while the International Opium Convention does not require the signatory Powers to at once put into force domestic legislation to carry out its pledges, nevertheless, this Government

---

[11] Foreign Relations of the United States. 1914.

has proceeded to put such legislation on the statute books in the hope that its action may be an incentive to the other Governments not to wait upon the exact terms of the Convention. I desire that you lay before the Conference a proper statement as to what the Federal Government has done in the way of legislation in accordance with the terms of the International Opium Convention, and if possible to use the action of this Government to secure similar action in the near future on the part of the other Governments."

* * * * *

"As to the great benefit which has accrued to this Government from the sincere cooperation of the other nations with it for the suppression of the evils associated with the opium and allied traffics, you should consult my letter of . . . to the Secretary of War congratulating him upon the practical suppression of the narcotic evil in the Philippine Islands.

"I may assure you that it is the President's earnest desire, one in which I warmly join, that the Conference which you are about to attend through harmonious consideration will accomplish the great purpose for which it is convened and mark the successful termination of this Government's eight years' effort to bring to an end an odious economic evil.

"I am (etc.)

"W. J. Bryan."

On June 26, 1914, the American delegates reported as follows: [12]

"Sir: The Third International Opium Conference closed its sessions on June 25th at 11 A. M. We have the honor to submit the following report in regard to it.

"It is important to keep clearly in mind the distinction between 'Invited Powers,' 'Signatory Powers' and 'Ratifying Powers.'

"At the opening of the Conference the position of the Powers was as follows: Forty-three 'Invited Powers' had signed the Convention of 1912, or intimated their intention of signing. Twelve 'Signatory Powers' had ratified it. Turkey and Servia had refused to sign. Greece had intimated willingness to sign for herself, but not for her colonies. (She has since signed for all.) The problem before the Conference, as defined by the Protocol of July 9, 1913, was 'the examination of the possibility of putting into effect the Convention of 1912' while two of the Invited Powers were still not Signatory Powers. On this question the opinions were divided as follows:

"A number of countries were apathetic, their subjects having no connection with the opium traffic either as traders or as consumers. Others, while approving the movement on humanitarian grounds, could not at once ratify the Convention because of constitutional difficulties in carrying out its provisions. Germany, however, was candidly unwilling to surrender her trade in narcotics and instruments for the administration thereof, unless the Convention could be approved by all invited Powers, especially Turkey, which otherwise might continue to supply the market. Great Britain, while in favor of the Convention and its enforcement, showed unwillingness to put it into force unless all Signatory

---

[12] Foreign Relations of the United States. 1914.

Powers (Germany especially) should concur. France and Russia apparently sympathized with this view.

"The delegations which strongly supported the idea of putting the Conventions into force, even if Turkey should continue obstinate, were those of the United States, the Netherlands, Italy, Belgium, Denmark, China, Japan, Siam, Persia, the South and Central American Republics.

"It was evident that, as Turkey could not be induced to sign, either the Convention must fail altogether, or the provision which made the execution of the Convention dependent on unanimity of all invited Powers must be modified, and the execution thereof made dependent on the consent of the Signatory Powers, disregarding the non-signers. If the assent of Germany could have been secured to this plan, the Convention could have been ratified and put into execution without great delay by all Powers except Turkey and Servia, which would thus have been forced eventually to join.

"This was the position taken by the American delegation in the resolution offered by their first delegate in the first session of the Conference, as follows:

"Resolved, That the Signatory Powers pledge themselves to ratify as soon as possible the Convention of 1912, and to put it into effect from the first of December, 1914.

"This was intended to mark the attitude of the United States in favor of the prompt mise en viguer of the Convention, as indicated in the Department's instruction of June 5, especially the paragraph: 'You may agree to put the International Opium Convention into force on behalf of the Government of the United States.' Although this resolution was referred to the Editing Committee and so disappeared in its original form, the principle of voluntary agreement of Signatory Powers in spite of the abstention of Turkey and Servia, became the link which held the Conference together.

"At the fourth session of the Conference the second delegate of the United States, in pursuance of the Department's instruction, made a clear and full statement of the legislation which our Government has enacted by way of carrying out the Anti-Opium Convention of 1912. A copy of this statement is enclosed. It impressed the Conference, and a sentiment disclosed itself among other delegates to have their countries do likewise. It became therefore a matter of great importance to act while this sentiment prevailed.

"In order at least to retain the progress made in this Conference, namely, the possibility of executing the Convention at once by such Powers as were prepared to do so, and to leave the door open to future adherents, the delegation of the Netherlands proposed to push this plan to a conclusion.

"The delegation of the United States, while seeking to secure unanimity of the Powers, and while prepared to propose (under your telegraphic instructions) an adjournment of the Conference until later in the summer in order to give time to secure unanimity, became convinced after consultation and consideration that such a proposal would certainly fail, it was also the judgment of your delegation that such adjournment, even if carried, would not tend to secure unanimity, but would rather dishearten Powers now prepared to act. These views were expressed to you in our telegram of June 23.

"The policy pursued by the delegation of the United States has been based on the determination in difficult circumstances to have the action of the Third Opium Conference mark a step forward if possible, but in any case to have it secure an open door for the future. This policy, which has been consistently maintained, was outlined in the opening address of the first American delegate, delivered in the course of the second session of the Conference on the 16th of June, in which he said 'We want to go forward with you. We want to have the Convention ratified and put into force as soon as possible, with as many signatory and adhering Powers as possible, but in any event put into force with as few or as many in America and Asia and Europe as will agree to make the adventure.'

"This wish has been more fully realized than seemed at first possible. The resolutions and avis brought forward by the Conference's Editing Committee were adopted by a unanimous vote. Copies thereof are enclosed, with translation.

"With the adoption of a Protocol of Cloture subsequently signed by all delegates present, and expressly approved by telegrams from those who were not present, the Conference came to a close.

"The delegation of the United States, the activity and influence of which had largely helped to bring about the unanimity in the adoption of the Protocol of Cloture, signed the same with satisfaction, feeling that this was a decided step toward the aim of all the Opium Conferences.

"The speech of the first American delegate at the close of the Conference (a copy of which is herewith enclosed) endeavored to state clearly the position of the United States as we have understood it from your instructions, as including:

"1. An earnest desire to make the Anti-Opium Convention of 1912 effective soon;

"2. A sincere wish that all nations shall join;

"3. A willingness to put it into force between a limited number of Powers under proper conditions;

"4. A definite intention to do this only in such form as will not foster nor permit a profitable monopoly in opium for the abstaining Powers.

"In our opinion the conclusions reached by the Third Opium Conference open the way to such a result. Diplomatic conversations with Great Britain and the Netherlands, the largest Colonial Powers in the East, and with China, Japan and Siam, will be necessary. The strongest efforts should be made to unite all these Powers in a plan for suppressing the trade in opium as an intoxicant, and limiting the commerce in it as a medicine to those nations which agree to this suppression.

"We are convinced that this method is the one most likely to lead to an ultimate unanimity of all the other Powers in the campaign against the opium evil. You will observe that full provision has been made for subsequent ratifications of the Convention as they occur.

"Our action as delegates has not in any way committed the United States to this plan, but has merely made sure that the way should remain open if our Government should wish to follow it."

The following is the final Protocol of the Third International Opium Conference:[13]

"'The Third International Opium Conference, convoked by the Government of the Netherlands in virtue of *voeu* No. III, uttered by the Second Conference, met at The Hague, in the Hall of the Knights, June 15, 1914.

"'The Governments enumerated below took part in the Conference for which they had designated the following-named delegates:

"'(Here follow names of Governments,—namely, Germany, the United States of America, the Argentine Republic, Belgium, the United States of Brazil, Chile, China, Denmark, the Dominican Republic, Ecuador, Spain, France, Great Britain, Guatemala, Haiti, Italy, Japan, Luxemburg, the United States of Mexico, Montenegro, the Netherlands, Persia, Portugal, Roumania, Russia, Siam, Sweden, Switzerland, Uruguay, and the United States of Venezuela—and of their delegates.)

"'A. Expressed the following opinions:

"'I. That it is possible to bring into effect the International Opium Convention of January 23, 1912, notwithstanding the fact that some Powers invited by virtue of S 1 of Article 23 have not yet signed the Convention.

"'II. That the coming into effect of the Convention as among all the signatory Powers will take place when those Powers that have already signed it, and those that have expressed their intention to adhere to it, shall have ratified it. The date of the coming into force of the Convention will be that which is fixed by S 1 of Article 24.

"'III. That if, at a date to be determined by the Conference, not all of the signatory Powers have yet deposited their ratifications, it will be possible for the signatory Powers, whose ratifications may have been deposited by that date, to put the Convention into effect. The same option will be allowed to those signatory Powers which may from time to time deposit their ratifications after that date.

"'IV. That the date contemplated by III is December 31, 1914.

"'V. That the opportunity to accede to the Convention remains open to those Powers which have not yet signed it.

"'B. Decided:

"'That a Protocol, by which the signatory Powers disposed to avail themselves of the option contemplated by III may declare their intention to bring the Convention into effect, will be opened at The Hague.

"'His Excllency the Minister for Foreign Affairs of the Netherlands, acceding to the wish unanimously expressed by the Conference, has consented to have such a Protocol drawn up, which will be kept open for signatures.

"'C. Adopted unanimously the following resolution:

---

[13] Translated from the Netherland Government's print entitled "Troisième Conférence Internationale de l'Opium. La Haye 15-25 juin, 1914—Actes et documents. Procès-verbaux officiels"—In: McMurray—Treaties and Agreements with and concerning China 1894-1919—Vol. II. Republican Period—1912-1919—p. 942.

"'The Conference invites His Excellency the Minister for Foreign Affairs of the Netherlands to undertake, in the name of the Conference, an urgent and respectful *démarche* towards those signatory Powers which have neither ratified the Convention nor expressed their intention to do so—a *démarche* intended to bring them to declare themselves ready in the near future to deposit their ratifications, in order that the Convention may come into force as soon as possible.

"'In faith of which the delegates have affixed their signatures to the present Protocol.

"'Done at The Hague, June 25, 1914, in one single copy, which shall remain deposited in the archives of the Government of the Netherlands, and copies of which, duly certified, shall be delivered through diplomatic channels to all the Powers, both signatory and non-signatory.'

"(Here follow signatures in behalf of the Powers, enumerated above, except Chile, the Dominican Republic, Ecuador, Haiti, and Uruguay, in regard to which the official print here quoted makes the annotation that 'communications having been interrupted in consequence of the war, it has not been possible to obtain signature, which it had not been feasible to give at the time of the closing of the Conference.')"

On December 17, 1914, an act, commonly known as the Harrison Narcotic Act, was approved by the President of the United States, which represented this country's attempt to carry out the provisions of The Hague Convention for the control of the distribution of the drugs in question. A digest of this law will be found in the chapter dealing with the national aspects of the problem.

On March 3, 1915, the following proclamation was issued by the President of United States putting into effect the Convention and Final Protocol: [14]

"Whereas a Convention between the United States of America and certain other Powers for the progressive suppression of the abuse of opium, morphine, cocaine, and derivative drugs, was concluded and signed by their respective Plenipotentiaries at The Hague on the twenty-third day of January, one thousand nine hundred and twelve, a certified copy of which Convention, being in the French language is word for word as follows:"

(Here follows the text of the convention and protocol)[15]

"And whereas, the said Convention and Final Protocol have been ratified by the Government of the United States of America, by and with the advice and consent of the Senate thereof, and by the Governments of China and the Netherlands, and the ratifications of the said Governments were deposited by their respective Plenipotentiaries with the Government of the Netherlands;

---

[14] Suppression of the Abuse of Opium and Other Drugs.—Convention and Final Protocol between the United States and Other Powers—Treaty Series No. 612—Washington: 1922.

[15] For text see Appendix I.

"Now, therefore, be it known that I, Woodrow Wilson, President of the United States of America, have caused the said Convention and Final Protocol, to be made public, to the end that the same and every article and clause thereof may be observed and fulfilled with good faith by the United States and the citizens thereof.

"In testimony wherof, I have hereunto set my hand and caused the seal of the United States to be affixed.

"Done at the City of Washington this third day of March in the year of our Lord one thousand nine hundred and fifteen, and of the independence of the United States of America (Seal.) the one hundred and thirty ninth.

"Woodrow Wilson.

"By the President:
W. J. Bryan
Secretary of State"

On March 3, 1915, the President also approved "An act to regulate the practice of pharmacy and the sale of poison in the consular districts of the United States in China." This law supplemented the Act of February 23, 1887 providing for the execution of article two of the Treaty of 1880 with China.

Due to the War a period of inactivity followed until, according to McMurray: [16]

"The Netherland Government under date of August, 1919, notified the other interested Powers that the Convention had been ratified by Denmark, Siam, Guatemala, Honduras, Venezuela, the United States of America, Portugal, China, Sweden, Belgium, Italy, Great Britain, the Netherlands, Nicaragua, Norway, Brazil, Ecuador, Uruguay and Spain. The Protocol for the putting into effect of the Convention had been signed only by the United States of America, China, the Netherlands, Honduras, Norway, Belgium and Luxemburg. The Convention was therefore in force only as among the Powers last specified."

However, the Treaties of Peace between the Allied and Associated Powers and Germany, Austria, Bulgaria and Hungary drawn up at the Peace Conference in Paris and signed in 1919 and 1920, provided for the bringing into force of the International Opium Convention and Special Protocol by including the following article in each treaty:

"Those of the High Contracting Parties who have not yet signed, or who have signed but not yet ratified, the Opium Convention signed at The Hague on January 23, 1912, agree to bring the said Convention into force, and for this purpose to enact the necessary legislation without delay and in any case within a period of twelve months from the coming into force of the present Treaty.

---

[16] Translated from the Netherland Government's print entitled Troisième Conférence Internationale de l'Opium. La Haye 15-25 juin, 1914—Acts et documents. Procès-verbaux officiels"—In: McMurray—Treaties and Agreements with and concerning China, 1894-1919—Vol. II. Republican Period—1912-1919—p. 942.

"Furthermore, they agree that ratification of the present Treaty should in the case of Powers which have not yet ratified the Opium Convention be deemed in all respects equivalent to the ratification of that Convention and to the signature of the Special Protocol which was opened at The Hague in accordance with the resolutions adopted by the Third Opium Conference in 1914 for bringing the said Convention into force.

"For this purpose the Government of the French Republic will communicate to the Government of the Netherlands a certified copy of the protocol of the deposit of ratifications of the present Treaty, and will invite the Government of the Netherlands to accept and deposit the said certified copy as if it were a deposit of ratifications of the Opium Convention and a signature of the Additional Protocol of 1914."

The ratification of these treaties automatically brought the Convention into force for the following countries:

"Austria, Bolivia, Brazil, Bulgaria, Cuba, Czecho-Slovakia, France, Germany, Great Britain and possessions, Greece, Guatemala, Haiti, Hungary, Italy, Japan, Liberia, Nicaragua, Panama, Peru, Poland, Portugal, Roumania, Serb-Croat-Slovene State, Siam and Uruguay."

Although the United States did not sign the Treaty of Versailles, article 295 of the Treaty of Versailles above quoted was incorporated in the Treaty between the United States and Germany Restoring Friendly Relations, signed August 25, 1921.

A further step which the Treaties of Versailles, St. Germain, Trianon and Neuilly undertook in relation to the international features of the opium problem consisted of a provision under article 23 of the Covenant of the League of Nations, which formed Part 1 of these Treaties. Article 23 reads as follows:

"Subject to and in accordance with the provisions of international conventions existing or hereafter to be agreed upon, the Members of the League:"

* * * * *

"(c) will intrust the League with the general supervision over the execution of agreements with regard to the traffic in women and children and the traffic in opium and other dangerous drugs."

On January 11, 1923, the following countries were listed as members of the League of Nations and therefore have subscribed to article 23 of the Covenant:

"Albania, Argentine Republic, Australia, Austria, Belgium, Bolivia, Brazil, British Empire, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czecho-Slovakia, Denmark, Ezthonia, Finland, France, Greece, Guatemala, Haiti, Hungary, Honduras, India, Italy, Japan, Latvia, Liberia, Lithuania, Luxembourg, Netherlands, New Zealand, Nicaragua, Norway, Panama, Paraguay, Persia, Peru, Poland, Portugal, Roumania, Salvador, Serb-Croat-Slovene State, Siam, South Africa, Spain, Sweden, Switzerland, Uruguay and Venezuela."

Having undertaken to interest itself in the opium problem from an international point of view, the League of Nations through its Assembly on December 15, 1920 adopted a Resolution in accordance with Article 23 of the Covenant authorizing the Secretariat to collect "information as to the arrangements made in the various countries for carrying out the Opium Convention, the production, distribution and consumption of the drugs, and other necessary data"; and creating an Advisory Committee on Traffic in Opium whose functions were:

1. "To secure the fullest possible co-operation between the various countries in regard to the carrying out of the Opium Convention.

2. "To assist and advise the Council in dealing with any question that may arise."

The first meeting of the Advisory Committee on Traffic in Opium was held in May, 1921.[17] In addition to preparing, at the request of the Secretariat, a questionnaire to be addressed to all governments, requesting information as to measures adopted for the carrying out of the Hague Convention, and the production, distribution and consumption of the drugs, the Committee made the following recommendations:

"1. (a) That the Council should use its influence with those States which are Members of the League and have not signed or ratified the Convention, to do so as soon as possible;

"(b) That the Netherlands Government should be asked to continue its efforts to secure ratification by those States which are not Members of the League.

"2. That a report should be made annually to the League by each country which is a party to the Convention, on the execution in its territory of the provisions of the Convention, with statistics of production, manufacture and trade.

"3. That the Council should consider the possibility of undertaking an inquiry through the International Health Organisation of the League, or otherwise, to determine approximately the average requirements of the drugs specified in Chapter III of the Convention for medical and other legitimate purposes in different countries.

"4. That the Council should suggest the adoption of the following procedure to the Governments which are parties to the International Opium Convention, in order to enable them to carry out their obligations under Articles 3 and 5, and under Article 13, of the Convention:

---

[17] Report of the Advisory Committee on Traffic in Opium. First Session. May 2-5, 1921.

"Every application for the export to an importer of a supply of any of the substances to which the Convention applies shall be accompanied by a certificate from the Government of the importing country that the import of the consignment in question is approved by that Government and is required for legitimate purposes. In the case of the drugs to which Chapter III of the Convention applies, the certificate shall state specifically that they are required solely for medicinal or scientific purposes.

"5. That the Council should suggest to the Treaty Powers that, subject to the consent of the Central Government of China, they should instruct their Consular Representatives in the Provinces to make strong representations to the Provincial Governors on the subject of poppy cultivation.

"6. That the Council should direct the special attention of the treaty Powers to the provisions of Article 15 of the Convention and urge that the most effective steps possible should be taken to prevent the contraband trade in opium and other dangerous drugs."

Except for No. 5, action on which was deferred, the above recommendations were approved by the Council and suitable resolutions adopted on June 28, 1921.[18] In addition, following the comments of Mr. Koo, the representative of China, who introduced the report of the Advisory Committee, a further resolution was passed. In part Mr. Koo stated: [19]

"In addition to the Recommendations of the Advisory Committee, I may point out to my colleagues another aspect of the opium question. Heretofore, except perhaps in China, international legislation has been directed towards the progressive limitation of the *traffic* in opium. A growing conviction, however, appears now to prevail in many countries that the nations of the world will be well advised to agree also upon a programme for the progressive suppression of the production of opium. For it is felt that to deal with the Opium problem satisfactorily it must be dealt with at the very root or source, and to this end the cultivation of opium should be reduced progressively and eventually limited to strictly medicinal and scientific purposes. If my colleagues share this view, it is desirable, as an initial step towards the attainment of this object, to request the Advisory Committee on Traffic in Opium to consider the question of making an enquiry into the approximate average requirements of raw and prepared opium specified in Chapters I and II of the Opium Convention for medicinal and scientific purposes in different countries."

The new resolution passed by the Council was as follows:

"That in view of the world-wide interest in the attitude of the League towards the Opium question and of the general desire to reduce and restrict the cultivation and production of opium to strictly medicinal and scientific purposes, the Advisory Committee on Traffic in Opium be requested to consider and report, at its next meeting, on the possibility of instituting an enquiry to determine approximately the average requirements of raw and prepared opium specified in Chapters I and II of the Convention for medicinal and scientific purposes in different countries."

---

[18] Resolutions adopted by Council of the League of Nations. Thirteenth Session—June 17-28, 1921.

[19] Minutes of the Thirteenth Session of the Council. June 17-28, 1921.

These resolutions of the Council were considered by the Fifth Committee of the Second Assembly[20] whose recommendations were accepted in substance by the Assembly on September 30, 1921, in the following form:[21]

"I.—The Assembly concurs in paragraphs 1, 2, 4, and 5 of the resolution adopted by the Council on June 28th, 1921, as follows:

"1. That States which are Members of the League and have not signed or ratified the International Opium Convention be invited to do so as soon as possible.

"2. That the Netherlands Government be requested to continue its efforts to secure ratification of the International Opium Convention by those States which are not Members of the League.

"3. (Paragraph 4 of the resolution of the Council.)

"That in order to carry out the obligations under Articles 3 and 5 under Article 13 of the International Opium Convention, the Governments which are parties to the Convention be invited to adopt the following procedure:

" 'Every application for the export to an importer of a supply of any of the substances to which the Convention applies shall be accompanied by a certificate from the Government of the importing country that the import of the consignment in question is approved by that Government and is required for legitimate purposes.

" 'In the case of drugs to which Chapter III of the Convention applies, the certificate shall state specifically that they are required solely for medicinal or scientific purposes.'

"4. (Paragraph 5 of the resolution of the Council.)

"That the special attention of the Contracting Powers having Treaties with China be invited to the provisions of Article 15 of the International Opium Convention, so that the most effective steps possible should be taken to prevent the contraband trade in opium and other dangerous drugs.

"II.—The Assembly confirms the second recommendation passed by the Advisory Committee on Traffic on Opium during its session of May 2nd-5th, 1921, as follows:

"5. That a report should be made annually to the League by each country which is a party to the Convention, on the execution in its territory of the provisions of the Convention, with statistics of production and manufacture of, and trade in opium.

---

[20] Traffic in Opium. Report of the Fifth Committee to the Second Assembly. Sept. 24, 1921.

[21] Resolutions and Recommendations adopted by the Assembly during its second Session. Sept. 5-Oct. 5, 1921.

"III.—The Assembly adopts the following additional resolutions and recommendations presented by its Fifth Committee:

"Resolutions.

"6. The Assembly urges those States Members of the League which have not yet signed and ratified the Opium Convention to do so as soon as possible.

"7. In order to facilitate the execution of the Convention, the Assembly urges all States Members of the League which are parties to the Convention to signify to the Secretariat as soon as possible their acceptance of the fourth recommendation of the Advisory Committee relating to the requirement of importation certificates.

"Recommendations.

"8. The Assembly concurs in paragraph 3 of the Council's Resolution of June 28th, 1921, on the understanding that the enquiries undertaken will be of a scientific character and that, when they apply specifically to any particular country, they will be made through, or with the consent of, the Government of that country.

"9. The Assembly recommends to the Council that, in paragraph 5 of the latter's resolution dated June 28th, 1921, it should also draw the attention of the Government of China to Article 15 of the International Opium Convention.

"10. The Assembly recommends to the Council that the enquiry referred to in paragraph 7 of the latter's resolution dated June 28th, 1921, should be extended to include all opium the consumption of which may be considered legitimate, and that to this end the word 'strictly' be omitted, and the word 'legitimate' be substituted for 'medicinal and scientific.' It further recommends to the Council the omission of the reference to prepared opium, that is to say, to opium prepared for purposes of smoking, the complete suppression of which is provided for in Chapter II of the Convention.

"11. The Assembly recommends to the Council that the different Governments be invited, where they see no objection, to furnish to the Secretariat, in addition to the official annual report, any information concerning the illicit production and manufacture of, or trade in, opium or other dangerous drugs, which they think likely to be useful to the League in the execution of its task.

"12. The Assembly recommends the Council to consider whether all nations specially concerned in either the growth or manufacture of opium or other dangerous drugs should not be represented on its Advisory Committee.

"13. The Assembly recommends the Council to request the Advisory Committee to extend their investigations to include not only the drugs mentioned in the Convention of 1912, but also all dangerous drugs of whatever origin which produce similar effects, and to advise as to the desirability of convoking a further international conference of States, which are parties to the Convention, as well as States Members of the League of Nations, with a view to drawing up a convention for the suppression of the abuse of such drugs."

It should be noted that the major difference between the resolutions passed by the Council and those adopted by the Assembly lies in the use of the term "medicinal and scientific." The Council's resolution provided for an inquiry to determine the requirements of raw and prepared opium specified in Chapter I and II of the Convention for medicinal and scientific purposes, while the Assembly substituted for "medicinal and scientific" the word "legitimate" and extended the scope of the resolution to include "all opium the consumption of which may be considered legitimate." The basis for this change is given in the comments contained in the report of the Fifth Committee as follows: [22]

"As regards the third recommendation, the ground for the alterations recommended by the Committee in paragraph 7 of the Council's resolution are to be found in the very special conditions obtaining in various countries, particularly in India. The Indian Delegate has informed the Committee that the number of properly equipped hospitals and dispensaries in India is inadequate to the needs of the population, which over vast areas is without medical assistance. In order to cope with the diseases with which some of these regions are constantly infected, the population has cultivated the opium poppy from time immemorial, and habitually takes opium in small doses as a prophylactic or an effective remedy. It is this use of opium which cannot be styled purely medical, i.e., that which is prescribed by a physician, that the Committee has in mind in using the term 'legitimate.'"

As the result of its second meeting on April 19 to 29, 1922, the Advisory Committee adopted the following resolutions: [23]

"(1) That the Council of the League should be requested to urge on all States which have not yet done so, and in particular on Switzerland, Persia and Turkey, the desirability of bringing the Opium Convention of 1911 into force in its entirety without delay.

"(2) That it is most desirable that the system of Importation Certificates unanimously adopted by the Council and the Assembly of the League should be brought into force by countries in Europe, America, Africa and Australia not later than September 1st, 1922, and by other countries not later than January 1st, 1923; and that the governments should be asked to adopt the form of Importation Certificate proposed by the Advisory Committee.

"(3) That the Health Committee of the League of Nations should be asked by the Council to continue their enquiries into the requirements of the various countries of morphine and other dangerous drugs for medicinal and scientific purposes.

---

[22] Loc. cit.

[23] Report on work of Advisory Committee on Traffic in Opium during its second session. Apr. 19-29, 1922. A-15, 1922. C-223 (1), 1922. XI.

"(4) That the Council should invite the governments of all States signatory to the Convention of 1912, and other States Members of the League, to furnish the Secretary-General of the League with a statement of their countries' total requirements for internal consumption per annum of opium and its derivatives, indicating separately, if possible, the quantities employed respectively for medicinal, scientific and other uses. The statement should distinguish the kinds of opium required and in the case of opium derivatives the amounts should be given in terms of morphine content.

"The Advisory Committee is further of the opinion that this statement should reach the Secretary-General not later than January 1st, 1923, and that it is of particular importance that the quantities of opium required for consumption in Far Eastern countries, where the Chinese are the principal consumers, should be available by that date.

"(5) That the Council of the League should, if the necessity arises, invite the governments of States which are Parties to the Convention to facilitate the carrying out in their territories of joint investigations by commissions, appointed partly by the government concerned, and partly by the League, into any questions arising under the Opium Convention.

"(6) (a) That the Committee having considered the reports, as communicated by the Chinese representative on the Committee, of the enquiries instituted by the Chinese Government into the alleged revival of opium cultivation in various provinces, and having had regard to the time at which, the conditions under which, and the position of certain of the persons by whom the enquiries were made, and to the fact that certain important districts had not been covered and having compared the reports with the information contained in the Blue Book issued by the British Government and with other information before the Committee,

"Regrets that while gladly acknowledging that in certain provinces efforts have been made by the authorities to enforce the prohibition of opium, it is forced to the conclusion that there is a large and widespread revival both of the cultivation and use of opium in China.[24]

---

[24] The following portions of this resolution were omitted from the report of the Advisory Committee as published August 8, 1922, for the reason that they constituted the only part of the report to which the Council made objection and were referred back to the Committee for reconsideration:

"Further, the Committee realizes that the responsibility for the revival rests mainly, if not wholly, on the military governors of the provinces concerned: and that at the present time, under the political conditions prevailing the pressure of public opinion is probably the only force available to remedy a state of things which is both a violation of the treaty engagements of China and inconsistent with its obligations as a Member of the League of Nations."

"(c) That, as China, in common with all other States Members of the League, has entrusted the League of Nations with the supervision of the traffic in dangerous drugs, the Chinese Government should invite representatives of the

"(7) That the Committee notes the promise of the Japanese Government, conveyed through its representative, to make the strictest possible investigation into the illicit traffic in morphine at present being carried on in the Far East; and it recommends that co-operation should be established between the Japanese authorities and the Chinese Maritime Customs, with a view to tracing the sources of contraband morphine. It is further desirable that the discrepancies between the Japanese import statistics and the export statistics of certain other countries should be cleared up.

"(8) That, in order to facilitate the general control of the traffic in dangerous drugs, the Committee recommends:

"(a) that the information with regard to the manufacture of cocaine should be completed as soon as possible;

"(b) that the Council of the League should invite the governments to furnish the Secretariat with as close an estimate as possible of the annual requirements of cocaine in their respective countries;

"(c) that the governments should arrange for the mutual exchange of full information concerning all seizures made by their respective Customs and Police authorities;

"(d) that the governments should consider the advisability of undertaking educational work as to the dangers of indulgence in the drugs;

"(e) that, as experience shows that, in consequence of the enormous profits realized by the illicit traffic in dangerous drugs, pecuniary penalties are no longer a sufficient deterrent, the governments should consider the question of providing for a substantial sentence of imprisonment as an alternative penalty;

"(f) That the list of drugs not covered by the Convention of 1912, communicated by the French Government, should be referred to the interested governments for their observations; and that pending the receipt of such information, the question of holding a further International Conference should be postponed.

"(9) That the offer of the League of Red Cross Societies to invite the National Red Cross Societies which are interested in the Opium question to undertake educational work as to the evil results of the abuse of opium should be accepted.

"(10) That the Council should invite the governments, in making their annual report to the League on Opium and other dangerous drugs, to adopt the form prepared by the Advisory Committee; to furnish the report not later than July 1st (in the case of Western Countries); and October 1st (in the case of Eastern countries); and to make the report in one or other of the official languages of the League."

League to accompany the Commissioners in their investigations; the Committee also desires to point out that investigation can only be effective if made during the season of the year while the poppy is in flower, and recommends that the Chinese Government should be asked to make arrangements accordingly."

"(d) That the Council should publish conclusions at which the Committee has arrived,"—

(We have been unable to locate section (b) of this resolution.)

On May 16, 1922, the Council passed the following resolution: [25]

"'The Council of the League of Nations, having considered the report presented by the Advisory Committee on the Traffic in Opium dated May 1, 1922,

"'Resolves as follows:

"'(1) The Council, not being confident that the questions dealt with in paragraph 3 of resolution 6 (a) of the report and in the corresponding passage of page 7 lay within the competence of the Advisory Committee on Traffic in Opium, considers that it would be advisable to omit this passage from the report.

"'(2) The Council, having considered the proposal made in resolution 6 (c) and the objections to this proposal made by the Chinese Representative on behalf of his Government, is of the opinion that the following resolution would afford a satisfactory solution of the problem, and should be substituted for the first part of resolution 6 (c):

"'That the Chinese Government shall be asked to invite the International Anti-Opium Association in Peking to nominate a representative as member of the Chinese Commission of Investigation and to authorize this member to transmit through the medium of the Chinese Government a report to the League in addition to the general report of the Commission of Investigation.

"'(3) The Council considers that paragraph 6 (d) might be omitted in view of the fact that the whole report as finally approved by the Council will be made public.

"'(4) The Council, therefore, approves the report with the exception of those paragraphs dealt with above.

"'(5) The Secretary-General is accordingly instructed, in consultation with the President of the Council,

"'(a) To communicate with the Chairman of the Committee regarding the modifications which the Council would desire made in the report;

"'(b) To transmit the report to the Assembly subject to the modifications as set out in these resolutions.'"

The portions of the Committee's report referred to in the preceding resolution of the Council were reconsidered by the Committe and the suggestions made by the Council were approved. The report of the Committee to the Council states: [26]

"1. The Council, at its session in July, requested the Advisory Committee to reconsider a passage in its report with reference to the situation in China, and in connection therewith, referred to it a suggestion for dealing with the situation which had received the consent of the Chinese Government and which the Council were prepared to approve. The suggestion in its complete form was to the effect that, having regard to the finding of the Committee with reference to the situation in China which appears in the report of the Committee as published, the Chinese Government should be asked to make more thorough enquiries as regards the cultivation of the poppy in China so as to be able to supply the League with a more reliable report than was forthcoming this year; to include in the Commission of Investigation representatives of organizations such as Chambers of Commerce and Educational Associations, and to associate with the Commission of Investigation a representative of the International Anti-Opium Association in Peking and to authorize this representative to transmit through the medium of the Chinese Government a report to the League in addition to the General report of the Commission of Investigation. The Advisory Committee understand that, as it will presumably be necessary to appoint a number of Commissions to investigate the conditions in the different provinces, as was done last season, the proposal means that a representative of the International Anti-Opium Association will be associated with each of the Commissions. The Advisory Committee, after full consideration and having regard to existing circumstances, are prepared to recommend to the Council the adoption of this course. It is understood that as the investigations can only be effective if made during the season of the year while the poppy is in flower, arrangements will be made by the Chinese Government accordingly.

---

[25] Minutes of the Eighteenth Session of the Council. Official Journal. June 1922. Vol. 3. No. 6.

[26] Supplementary Report—Advisory Committee on Traffic in Opium—Third Session, Sept. 1, 1922.

"2. The Advisory Committee notes with regret that a large number of Governments have not yet replied to the Secretary-General's letter of May 30th, 1922, on the subject of the introduction of the import certificate system, and that comparatively few of the Governments who have replied have definitely agreed to bring that system into force on the dates suggested by the Committee. No objections have been lodged by any Government to the system in itself, and its early, and, so far as possible, simultaneous, introduction by all Governments appears to the Committee of the utmost importance.

"The only practical means of exercising effective control over the traffic is to secure the assent of all countries to the immediate introduction of the import and export certificate system.

"The Committee therefore recommends that the attention of all Governments which have not yet agreed to bring the system into operation on a fixed date should again be invited to the matter, and that its vital importance should be emphasized as strongly as possible, as also the urgent necessity for the early and universal adoption of the system.

"3. The Committee has had before it a suggestion from the Health Committee of the League that for the purpose of facilitating the investigation into the requirements of the drugs, for medical and scientific purposes and any other investigations into questions on which the Advisory Committee may desire an expert medical opinion, an expert sub-committee of the two organizations should be formed.

"The Committee concurs in thinking the appointment of such a sub-committee desirable, and if it is approved by the Council it would nominate as its representatives Mr. J. Campbell and Dr. Anselmino.

"With a view of avoiding expense, the Committee thinks that, as far as possible, such meetings of the sub-committee as may be necessary should take place at the same time as the meetings of the Advisory Committee. Much of the work of the sub-committee could no doubt be conducted by correspondence."

This report was approved by the Council on September 2, 1922.

In the meantime, on May 26, 1922, what is known as the "Narcotic Drugs Import and Export Act" was approved by the President of the United States.[27] This act was promulgated as an evidence of the intent of the United States to carry out the provisions of the Hague Convention. It provides for the creation of a Federal Narcotics Control Board to regulate the importation and exportation of narcotic drugs. The law also prohibits exportation of the drug to any country except those countries which are parties to The Hague Convention and have instituted a satisfactory system of permits for the control of imports.

In discussing this bill before the House of Representatives, Mr. Hadley stated: [28]

"Mr. Chairman, this legislation contemplates the further amendment of the existing narcotic laws in three principal respects. There are many incidental points, but the three grand divisions, so to speak, under which the provisions of this bill would classify are, first, the provision for further restraint upon the importation of narcotic drugs as defined in the bill; second, upon their exportation; and third, with respect to the in-transit shipments.

"In 1909 Congress passed an act prohibiting the importation of smoking opium but permitting the importation of other classes of opium and their preparations and derivatives for medicinal purposes only and providing penalties, but made no restriction upon the exportation of these commodities. In 1912 the international opium convention was held at The Hague, in which we assumed certain obligations with respect to the opium traffic.

"That convention having been ratified by this Government in 1913, it was followed in 1914 by further legislation on the part of Congress, putting limitations upon imports and exports and perpetuating in effect the importation provision of the law of 1909. But the restrictions placed on the exports, if intended to bring the Government fully within the terms of the international opium convention, failed in some important particulars. To remedy that failure is one of the main purposes of the bill."

* * * * *

"Under the existing narcotic laws prepared opium may be imported into this country. The proposal now is to limit the importation to crude opium and coca leaves from which cocaine is derived. This country manufactures all and more than it requires of narcotic drugs for domestic medical and legitimate uses, and it is thought desirable on the part of the committee, in view of the character of the commodities and the well-known illicit traffic in the business and the deleterious effects, that we restrict the importation as to crude material in furtherance of our obligation to keep the traffic within the legitimate uses, the medical use in particular. That is one of the outstanding features of the bill.

---

[27] Congressional Record—May 4, 1922. p. 6886.

[28] For text see Appendix IV.

"The exports and imports of narcotic drugs are governed by the act of 1909 as amended by the act of January 17, 1914. The exportation may be made under the present law to any country which regulates the entry of narcotic drugs under such regulations as are prescribed by such country, however ineffectual the regulations or the administration of the regulations may be in that country. In fact, the testimony in the hearings held on the subject in the Sixty-sixth Congress tended to disclose an alarming state of facts as to the diversion of exports from this country into China, and the subsequent return of many exports into our own country."

* * * * *

"One of the articles of the convention required, in substance, without reading it in detail, that the contracting powers shall enact laws and regulations in such a way as to limit the sale and use of morphine, cocaine, and their respective salts to medical and legitimate uses only, unless they have existing laws already so providing. And that they shall also cooperate among themselves in order to prevent the use of these drugs for any purpose other than a legitimate purpose. Another provision is to the effect that the contracting powers shall use their best efforts to control or cause to be controlled all those who import or export morphine, cocaine, or their respective salts. Another, that they shall proceed to the end that those who manufacture, import, sell, distribute, and export morphine, cocaine, and their respective salts shall be provided with authorization of licenses to carry on these operations or shall make an efficient declaration thereof to the competent authorities. Another provision in article 12 is to the effect that the powers shall use their best efforts to limit the importation of morphine, cocaine, and their respective salts to authorized persons. Further in article 13, to the effect that they shall use their best efforts to adopt or cause to be adopted measures to the end that the exportation of cocaine, morphine, and their respective salts from their countries to the countries of the other contracting powers shall be to those who have received authorizations or permits granted in conformity with the laws or regulations of the importing country.

"These provisions have not been adequately met by the terms of existing laws. The bill provides in the committee amendment that in the exportation to countries which are parties to the international opium treaty there shall more appear than the mere fact of having become parties to that convention; there shall be[29] more appear than the mere fact that the country has also adopted regulations with respect to the exportation. First, it shall further appear that such country has instituted and maintains in conformity with the convention a system which the board deems adequate of permits or licenses for the control of imports of such narcotic drugs. In the second place, it shall further appear that the narcotic drug is consigned to an authorized permittee, and third, that there must be furnished to the board proof deemed adequate by it that the narcotic drug is to be applied exclusively to medical and legitimate uses within the country to which it is exported, that it will not be re-exported from such country, and that there is an actual shortage of and a demand for the narcotic drug for medical and legitimate uses within such country.

---

[29] This is evidently a typographical error.

"Those provisions will carry out the spirit and purpose and terms of the obligations assumed in these respects under the international opium convention, but until some such legislation is enacted we are in the position of having assumed these obligations and of not having fulfilled them, and, on the contrary, of having permitted exportation in violation of the spirit of the convention; although in fairness to the present situation it should be said that while some six years elapsed after the ratification of that convention before regulations contemplated by the law of 1914 were approved and put in force by the executive departments charged with that duty, the war intervened, and after the war on the 1st day of May, 1920, such regulations were promulgated and given effect. Since then the difficulties which were complained of upon the hearings when the bill was introduced in the preceding Congress and the conditions which existed at that time have been very much minimized, and the regulations have had a very salutary effect.

"But it is the view of the committee that a matter of this gravity, involving the obligation of this Government deliberately assumed, should not rest upon administrative regulation alone but that the policy to be enforced should be given a firmer legal basis and be expressly incorporated in the law of the land. A third purpose to which I briefly alluded is to regulate in-transit shipment and transshipments. In the present law there is a provision which prohibits the transshipments and in-transit shipments of smoking opium. It does not extend to the other drugs which we define in this bill. The drugs covered in the bill under the terms of the definition are opium, coca leaves, cocaine, or any salt, derivative, or preparation of opium, coca leaves, or cocaine, so when the words 'narcotic drugs' appear in the bill that is what they embrace. Under the terms of this amendment the in-transit provisions of the present law are extended so as to include all these narcotic drugs but making in-transit shipments of narcotic drugs other than smoking opium subject to the approval of the board. Great Britain has recently enacted regulatory provisions, among others governing in-transit shipments and shipments from a foreign country can not be made through Canada or by Canadian roads or by British vessels. We are in the unenviable position of leaving our ports open to the unregulated transshipment through our country of commodities marked pharmaceutical in character, thus making us in a measure parties to the illicit use of so much of these transshipped commodities as may find their way illicitly into other countries than the port of destination."

Returning to the work of the League, after due consideration of the Report of the Advisory Committee, on recommendation of its Fifth Committee, the Third Assembly passed the following resolutions [30] on September 19, 1922:

---

[30] Resolutions and Recommendations of the Third Assembly. September 4-30, 1922. Official Journal Special Supplement, October 1922.

"I. The Assembly, being convinced that the most practical means of exercising control over the traffic in dangerous drugs is by means of the import and export certificate system, and believing that only international action can make this system a success, urges on all Governments the vital necessity of adopting this import and export certificate system without delay.

"II. The Assembly inclines to the view that the Governments which are Parties to the International Opium Convention should be asked to agree not to issue licenses for the import of opium, or the other drugs to which the Convention applies, from any country which has not yet ratified and put into force the Convention, and adopted the system for the control of exports and imports approved by the Second Assembly in Paragraph I (3) of the resolution adopted on September 30th, 1921, and previously approved by the Council on June 28, 1921.

"The Assembly considers this question important and urgent, but, recognizing the complicated and technical character of the issues involved, it is of opinion that the matter should be examined in detail by the Advisory Committee on Traffic in Opium before any definite action is taken. It therefore requests the Council to convene a meeting of the Advisory Committee as soon as possible to study the question, and should that Committee report in favour of the proposal, the Council is asked to act at the earliest possible date on the recommendations of the Advisory Committee in the form approved by the Council, and without further reference to the Assembly if the Council considers such reference unnecessary.

"III. The Assembly, being of the opinion that the first step necessary in limiting the world's supply of dangerous drugs to legitimate uses is a knowledge of the amount of drugs required by each country for internal consumption, urges the Governments to supply the returns asked for with the least possible delay and with the greatest accuracy in their power. The various Governments should, with a view to allowing comparison to be made, state clearly the system adopted in arriving at the estimate, and should supply a secondary statement showing the estimated consumption per 100,000 inhabitants.

"IV. The Assembly again desires to emphasize the view expressed in the report of the Advisory Committee (A. 15. 1922. XI) that, so long as the drugs to which Part III, particularly Article 9, of the International Opium Convention applies, are produced in quantities exceeding the legitimate requirements, there is a great danger that the surplus will find its way into illegitimate channels, and that the control of production, so as to limit it to the amount required for medical and legitimate purposes, is the most effective method of putting a stop to the illicit traffic. It recommends that the enquiry now proceeding into the world's legitimate requirements should be pressed forward as rapidly as possible, and expresses the hope that a provisional estimate and scheme will be submitted to the Assembly next year.

"V. The Assembly.

"Convinced of the urgent necessity of securing the fullest possible cooperation in the work of the Advisory Committee on Traffic in Opium and other dangerous drugs;

"Considering the fact that the United States of America is one of the most important manufacturing and importing countries:

"Recommends to the Council of the League that it should address a pressing invitation to the Government of the United States to nominate a member to serve on the Committee."

The Advisory Committee was specially summoned by the Council to consider one of the resolutions adopted by the Assembly at its meeting in September, 1922. This meeting, the fourth session of the Committee, was held January 8 to 14, 1923. The resolution to be considered reads as follows:

"The Assembly inclines to the view that the Governments which are Parties to the International Opium Convention should be asked to agree not to issue licenses for the import of opium, or the other drugs to which the Convention applies from any country which has not yet ratified and put into force the Convention, and adopted the system for the control of exports and imports approved by the Second Assembly in paragraph 1 (3) of the resolution adopted September 30th, 1921, and previously approved by the Council on June 28th, 1921. The Assembly considers this question important and urgent, but, recognizing the complicated and technical character of the issues involved, it is of opinion that the matter should be examined in detail by the Advisory Committee on Traffic in Opium, before any definite action is taken. It therefore requests the Council to convene a meeting of the Advisory Committee, as soon as possible, to study the question, and should that Committee report in favour of the proposal, the Council is asked to act at the earliest possible date on the recommendation of the Advisory Committee in the form approved by the Council, and without further reference to the Assembly if the Council considers such reference unnecessary."

The following recommendations were adopted by the Committee: [31]

"(1) That a final decision in regard to the suggestion contained in the second resolution adopted by the Assembly of September 1922 for dealing with the situation created by the abstention of certain countries from putting into force the International Opium Convention and the import certificate system, be postponed until the next session of the Opium Committee. At this session the Committee will consider any other suggestions for dealing with the situation that may be submitted.

"(2) That the Council be asked, in the meantime, to take all possible steps with the Governments of the States in question to secure their adhesion to the Convention and acceptance of the import certificate system. Special enquiries would be desirable in regard to the abstention of the South and Central American States.

"(3) That the Council be asked to urge the Governments which have not yet furnished their report and statistics for 1921 to send them immediately, so that they may be available for the Committee at their next meeting, and that the Governments should also be asked to furnish, if possible, preliminary statistics for 1922.

---

[31] Advisory Committee on the Traffic in Opium and other Dangerous Drugs. Report to the Council on the Work of the Committee during its Fourth Session held at Geneva. January 8-14, 1923. C. 37-1923. IV.

"(4) That, in the case of preparations of the drugs mentioned in Article 14 of the Convention, a limit shall be fixed below which, for the purposes of the statistical returns, imports and exports might be disregarded if desired, and that for the preparations of each of the drugs morphine, heroin, and cocaine, the limit shall be 3 kilos. This resolution does not apply to the pure drugs and their salts.

"(5) That the Committee concurs in the proposals of the Joint Sub-Committee of the Health and Opium Committees as to the methods to be adopted for determining the world's legitimate requirements of the drugs.

"(6) That the observations of the Governments on the list of drugs not included in the Convention submitted by the French Government be referred to the Joint Sub-Committee for consideration and report.

"(7) That the Committee concurs in the proposals of the Sub-Committee of the Transit Committee as to the control of the traffic in the drugs at 'free ports.'

"(8) That the Governments be asked to extend the arrangement for the mutual exchange of information in regard to seizures to include information in regard to the proceedings and movements of persons who are known to the authorities to be engaged in carrying on an illicit international traffic in the drugs."

The following is the report of the Mixed Sub-Committee of the Health Committee and of the Advisory Committee on the Traffic in Opium referred to in the above resolution which met on January 5th to 6th, 1923.[32]

"At its first meeting the Mixed Sub-Committee appointed Dr. Anselmino as Rapporteur and requested him in the first place to submit a reply on the questions placed on the agenda:

"1. An examination, in the light of previous enquiries conducted by the Health Committee, of the figures furnished in reply to a circular letter sent to all the States signatory to the Convention and to other States Members of the League of Nations, asking them to state the total quantity of opium and of its derivatives considered necessary each year for the needs of home consumption;

"2. Investigations, with a view to evolving a satisfactory method of determining the quantities of opium, derivatives of opium and other noxious drugs required each year for the needs of the home consumption of the various countries.

"In order to deal with this subject in all its aspects, the Rapporteur again entered into a systematic investigation of the campaign against narcotics. He formulated five questions of principle and endeavored to reply to them.

"1. What is the aim of the work undertaken by the League of Nations?

---

[32] Report of Advisory Committee on the Traffic in Opium and other Dangerous Drugs. Fourth Session. January 8-14, 1923. Annex 6.

"2. What constitutes an abuse?

"3. How do abuses occur?

"4. How can these abuses be ascertained?

"5. How can abuses be prevented?

"1. *The aim of the work* of the League is to limit and finally to prevent the abuse of opium, of morphine, of diacetyl-morphine and of cocaine.

"2. What constitutes an abuse?

"After a detailed discussion, and in view of the fact that the Sub-Committee was instructed to draw up its report solely from the health and medical point of view, it was decided that medical use should be considered the only legitimate use and that all non-medical use should be recognized as an abuse, and also that, in the opinion of doctors, the use of opium as a stimulant could not be considered legitimate even in tropical countries.

"3. How do abuses occur?

"In Europe and in countries whose customs are similar to those of Europe, the abuse of drugs occurs chiefly as a consequence of their employment for medical purposes. Doctors should be made to see that morphine must only be employed in cases of absolute necessity. In all cases where it is desired to influence the respiratory system or to provide remedies for coughing, morphine should invariably be replaced by codeine or dionine.

"In no case should an attempt be made to cure morphino-mania by the use of cocaine. Morphino-mania is scarcely ever the result of inducement. On the other hand, cocaino-mania is nearly always intensified by this means. While the morphino-maniac conceals his practice of the vice, the cocaino-maniac will only inhale cocaine in company with others. If he has no companions, he endeavours to find them and induces individuals who are not yet cocaino-maniacs to imitate him. As a rule it is persons of weak character, youthful psychopaths, who yield to the temptation, and cocaino-maniacs may be divided into two perfectly distinct categories: those of the demi-monde and those of the proletariat. The latter is by far the most dangerous, because in this category, energies which might be of value for production are destroyed in a very short time.

"No objections were raised to the Rapporteur's reply, which, however, only dealt with conditions in Europe.

"4. How can abuses be ascertained?

"The Rapporteur began by describing the situation in Germany, and then continued:

"The figures in possession of the Health Committee with regard to the annual consumption per head of the population in Canada, Denmark, Luxemburg, Sweden and Switzerland have, as regards to the consumption of codeine, dionine and other drugs which are derivatives of morphine, been extended by introducing a figure equivalent to that relating to morphine (except in the case of Canada, which gave the figures for the consumption of codeine and dionine). This method can only give approximate results, and the figures are undoubtedly inaccurate, but as the same error appears in the returns for Denmark, Luxemburg, Sweden and Switzerland, the results thus arrived at enable a comparison to be made.

"In the case of Canada, the consumption of morphine to codeine is as 1: 0.7.

"In the case of the United States, the consumption of morphine to codeine is as 1: 2.

"The figures for morphine in all its forms (hydrochlorate, sulphate, nitrate) and of codeine, dionine, etc., have been reckoned as being ten times the quantity of opium. This method also is approximate and gives no exact results; for opium employed in manufacture contains more than 10 per cent of morphine; on the other hand, the whole of the morphine is not obtained in a pure state on manufacture and the amount of the codeine contained in opium should be added in the calculations.

"Hydrochlorate of morphine contains only about 75% of morphine, and sulphate of morphine still less; in the same way heroin and codeine salts should not be placed side by side as regards the amount of morphine which they contain. For the object we have in view the calculations required would prove unnecessarily difficult and at the present time would yield no useful results. In my opinion, accurate figures can be obtained if all the calculations are made using morphine as a basis.

"Moreover, the figures given for consumption give no information of the extent to which morphine and raw opium are used in patent medicines, as, for example, Pavon, Pantopon, Opon, etc. Allowing estimates of consumption in Germany, a further amount of from a fourth to a third of the requirements in pure morphine salts must also be included in the calculations, the result being that we may estimate the consumption (the figures for morphine in Sweden are particularly low compared with those for Denmark, Luxemburg and Switzerland) at 0.9 grammes or 15 grains of raw opium per head of the population per annum in all those countries of Northern and Central Europe for which we possess figures. The returns for Switzerland seem to be very high; they were probably reckoned on the basis of the Swiss population, whereas foreigners are the great consumers of these drugs in Switzerland.

"The Sub-Committee then decided as follows:

"(a) The difference between the total of the amount imported and produced and the amount exported, taking the stocks at the beginning and at the end of the year, represents the total quantity used (both legally and illegally). M. Blanco will be good enough to put into convenient form the information given in the summary of the replies to the questionnaire per head of population for each country and compare the figures thus obtained.

"The difference between the total amount used and the quantity used for medical purposes would give an approximate idea of the amount used abusively.

"(b) In what manner can the quantities necessary for medical consumption be determined?

"System I.—By accurate and regular methods of supervision, such as those carried out, for example, in the United States and Germany.

"System II (applied, e.g., in Switzerland).—By direct enquiries made in hospitals and from chemists, dispensing physicians, dentists and veterinary surgeons.

"From these enquiries the quantities consumed for medical purposes will be obtained.

"System III.—By determining the extent of the incidence of the disease in any given country, taking as a basis the statistics of insurance companies and funds which insure against the disease.

"Ascertaining, from enquiries, addressed to a limited number of general hospitals, the average consumption of narcotics per patient and per year. By multiplying the first figure by the second, the average annual legitimate consumption throughout the country is obtained.

"System IV.—By statistics obtained through the employment of import and export certificates.

"The Sub-Committee cannot see its way to propose any single method which could be employed for all countries, but is of opinion that various methods should be examined in order to obtain the figures for the medical requirements of the different countries.

"5. How can abuses be prevented?

"In his reply, the Rapporteur only considered the European aspect of the question; he was of opinion that the Health Committee should, purely from a medical point of view, approach doctors in the different countries in order to bring them to the view that morphine should be employed only in case of absolute necessity. In all cases, for example, in which it is desired to treat the respiratory system, or in all cures employed for coughs, it is essential that codeine or dionine should be used instead of morphine. If morphine is absolutely necessary for the success of the treatment, the doctor should not prescribe a quantity larger than is absolutely necessary. He should never allow the patients to make injections themselves but should always perform this operation himself. If this is not possible, he should himself give instructions to and supervise the nurses.

"In no case should it ever be attempted to cure morphino-mania by cocaine.

"In most cases harmless drugs such as novocaine may be employed instead of cocaine.

"This question does not come within the competence of the Advisory Committee on the traffic in Opium, but the Health Committee will no doubt adopt the proposal which has been made."

The report of the Advisory Committee was accepted and the following resolution adopted by the Council on February 1, 1923:

"The Council approves the Report of the Advisory Committee on Traffic in Opium and other Dangerous Drugs and requests the Secretary-General to take all necessary steps in order that the recommendations of the Committee may be carried out."

On January 21, 1923, Mr. Stephen G. Porter introduced in the House of Representatives House Joint Resolution 430 "requesting the President to urge upon the governments of certain nations the immediate necessity of limiting the production of habit-forming narcotic drugs and the raw materials from which they are made to the amount actually required for strictly medicinal and scientific purposes."

After several hearings, the Committee on Foreign Affairs to which the Resolution, which had been amended and taken the form of H. J. 453, had been referred, reported it back favorably with two minor amendments on February 21st. The report states in part: [33]

"Your committee has held extensive hearings on the question of habit-forming narcotic drugs and has had the benefit of reliable testimony regarding the growth and cultivation of the poppy (Papaver somniferum) from the coagulated juice of which opium and its derivatives, such as morphia, codeine, and heroin, are obtained, and of Erythroxylum coca from the leaves of which cocaine and other habit-forming narcotic and deleterious drugs are derived.

"The testimony indicates that the growth of the raw materials from which these drugs are obtained is enormously in excess of the quantity that would be required if the production of such drugs were restricted exclusively to the amount required for strictly medicinal and scientific purposes."

* * * * *

"It has not been possible to ascertain with accuracy the amount of habit-forming narcotic drugs that is required for proper purposes but if the principle stated in the resolution was agreed to, namely, that production shall be confined exclusively to the amount required for strictly medicinal and scientific purposes, such requirement could be determined through various sources, such as professional and commercial individuals and concerns duly authorized to dispense them, who are required by a majority of the larger nations to keep an accurate record of the quantities so dispensed, under severe penalty for infraction. The hospitals, sanitariums, penal, and other institutions would also be very helpful in assisting in determining the amount actually needed for strictly medicinal and scientific purposes.

"Statistical records and the evidence of the witnesses appearing before your committee place the consumption of habit-forming drugs for medicinal and scientific purposes to from 5 to 125 tons per year. The varying opinions of these witnesses prevent an accurate estimate of the amount actually required for these specific purposes. But assuming that the maximum quantity of 125 tons is required to fulfill these strictly proper needs, the huge production of the raw materials greatly exceeds that which would ordinarily be needed—if the growth and production were confined to providing only for medicinal and scientific purposes—and thus releases for immoral and illicit use approximately 1,350 tons per annum."

* * * * *

"This overgrowth and resultant overproduction of the opium-producing poppy and coca leaves have made possible vast quantities reaching the hands of unscrupulous traffickers, who, by reason of the smallness of bulk of these products, and the large financial gains obtained from their illicit handling, easily transport, without fear of detection, and are enabled to smuggle large quantities of morphia, codeine, heroin, cocaine and other preparations into the United States and other countries where they are disposed of to those who engage in the nefarious trade of selling them to the unfortunates who have become addicted to their use."

---

[33] Limiting the Production of Habit-forming narcotic drugs and the raw Materials from which they are made—H. R. Report No. 1678—67th Congress, 4th Session.

* * * * *

"Notwithstanding that many nations have antinarcotic laws which impose heavy penalty for violation thereof, unlawful traffic in habit-forming narcotic drugs continues. In the United States of America, although our laws are designed to suppress illicit handling of these drugs, their use by addicts is constantly growing and we are justified in the conclusion that radical and efficacious remedial action must be inaugurated and strictly enforced.

"Nor have international treaties availed in restricting traffic in these drugs, specifically the treaty resulting from the meeting of the International Opium Commission at Shanghai, China, in 1909, and the conference at The Hague in 1911 and 1912. The failure of this treaty was made possible by the fact that instead of placing limitation upon production, attempt was made to regulate the traffic in habit-forming narcotic drugs by restricting their transportation and sale. Evasion of this restriction is easily accomplished by reason of the fact that illicit traffic through surreptitious channels and sources is readily and safely engaged in, the drugs finding a waiting and eager market in practically every country where addiction to their unlawful use has been acquired.

"It should be of interest to know that $5,000 worth of morphia, codeine, heroin, or cocaine may be safely concealed in a suit case; that in a hollow cane of average thickness a thousand dollars' worth may be secreted. It was stated in your committee that on a steamer crossing the Pacific some one happened to examine a particular bamboo chair and found that its hollow bamboo was filled with morphia.

"The sundry and varied manners and forms in which traffickers ply their illicit trade would prove interesting reading and be striking evidence of the ease with which the drugs are transported from country to country. Based upon this, we may justly conclude that no domestic law, to say nothing of international agreements or treaties, which, as has been stated, have already proved impotent in dealing with the question, can control this traffic. It reaches even our penitentiaries and jails; our extensive seacoast and long boundaries easily provide many points of ingress to the United States of huge quantities of these vicious drugs. The drug seller naturally seeks the most lucrative market for his abominable trade, and is assured by uncontrollable and favorable geographic conditions of easily and safely diverting to this country enormous amounts of morphia, codeine, and heroin, and similar drugs from the Orient, where the opium, from which they are made, is sold freely and without questioning as to its ultimate destination and use."

* * * * *

"It is the sense of your committee that in order to suppress the far-reaching and demoralizing use of opium and its derivatives and cocaine and similar habit-forming narcotic drugs action must be centered upon the necessary control and limiting of the growth and production of the plants from which these drugs are obtained, so that the amounts of each obtainable may be no greater than the demands for them made necessary by strictly medicinal and scientific needs.

"In the case of opium and its derivatives, restriction and limitation upon the growth and production of the opium-producing poppy may be placed upon India by the Empire of Great Britain, which exercises sovereignty over the possession; and by virtue of their own sovereign power, the Kingdom of Persia and the Empire of Turkey can impose similar restrictions and limitations upon growth and production within and exportation from their respective countries."

The resolution as finally passed by the Senate and House of Representatives follows:

"Whereas the unlawful use in the United States of America of opium (the coagulated juice of Papaver somniferum) and its derivatives (morphia, codeine, heroin), and cocaine (obtained from coca leaves—Erythroxylum coca) and other preparations made from these plants or their by-products, with attendant irreparable injury to health and morality and resultant death from continued use, is increasing and spreading; and

"Whereas the special committee of investigation of traffic in narcotic drugs appointed by the Secretary of the Treasury, in its report dated April 15, 1919, having considered the secrecy connected with the unlawful sale and use of these drugs, and the other difficulties in obtaining information which would give the exact number of addicts in the United States says: 'The committee is of the opinion that the total number of addicts in this country probably exceeds 1,000,000 at the present time', and further says that 'the range of ages of addicts was reported as 12 to 75 years. The large majority of addicts of all ages was reported as using morphine or opium or its preparations. . . . Most of the heroin addicts are comparatively young, a portion of them being boys and girls under the age of 20. This is also true of cocaine addicts', and as this report is in harmony with the opinion of many who have carefully investigated the subject; and

"Whereas the annual production of opium is approximately 1,500 tons, of which approximately 100 tons, according to the best available information, is sufficient for the world's medicinal and scientific needs, and the growth of coca leaves is likewise greatly in excess of what is required for the same needs, and thus vast quantities of each are available for the manufacture of habit-forming narcotic drugs for illicit sale and consumption; and

"Whereas opium is obtained in paying quantities from poppies cultivated in small areas of India, Persia, and Turkey, where the soil and climate are peculiarly adapted to the production of poppies containing opium rich in morphia, codeine, and other narcotic derivatives; and

"Whereas in Persia and Turkey the growth of the poppy and the production of opium therefrom, resulting in large revenues to those respective Governments, is controllable by virtue of their sovereign power to limit the exportation thereof and to restrict production to the quantity actually required for strictly medicinal and scientific purposes; and

"Whereas the British Government in India, which derives large revenues from the growth of the poppy and the production of opium therefrom, has full power to limit production to the amount actually required for strictly medicinal and scientific purposes; and

"Whereas the production of coca leaves (Erythroxylum coca) is limited to certain areas of Peru and Bolivia and the Netherlands possession of Java, and their production is controllable by virtue of the sovereign power of those Governments to limit the exportation thereof and to restrict production to the quantities actually required for strictly medicinal and scientific purposes; and

"Whereas the antinarcotic laws of a majority of the larger nations of the world provide severe penalties for dispensing habit-forming narcotic drugs without a record of the amount thereof dispensed, thus providing reliable data from which a reasonably accurate calculation can be made of the amount of these drugs needed for strictly medicinal and scientific purposes; and

"Whereas on January 23, 1912, as the result of the meeting of the International Opium Commission at Shanghai, China, in 1909, and the conference at The Hague in 1912, a treaty was made between the United States of America and other powers which was intended to suppress the illicit traffic in habit-forming narcotic drugs, and notwithstanding that upward of seven years have passed since its ratification, the treaty and the laws in pursuance thereof subsequently adopted by the contracting powers have utterly failed to suppress such illicit traffic, by reason of the fact that the treaty attempted to regulate the transportation and sale of these drugs without adequate restriction upon production, the source or root of the evil; and

"Whereas failure of such treaty and the laws adopted in pursuance thereof to provide adequate restrictions upon production has resulted in extensive and flagrant violations of the laws by reason of the fact that the great commercial value of these drugs, the large financial gains derived from handling them, and the smallness of their bulk, which renders detection in transportation and the sale exceedingly difficult, have induced and encouraged the unscrupulous to divert enormous quantities into the channels of illicit international traffic, thereby rendering partially, if not wholly, ineffective the treaty and the laws adopted in pursuance thereof; and

"Whereas in June 1921 the opium advisory committee of the council of the League of Nations adopted a resolution urging the restriction of the cultivation of the poppy and the production of opium therefrom to 'strictly medicinal and scientific' purposes, which resolution was approved by the council of the league, but when said resolution was presented for final approval to the assembly of the league, which is composed of a representative from each nation which is a member thereof, it was amended by striking out the words 'strictly medicinal and scientific' and substituting the word 'legitimate' in lieu thereof; and

"Whereas the substitution of the general word 'legitimate' for the specific words 'medicinal and scientific' permits the continuance of the sale of enormous quantities of opium and its derivatives in many sections of the Orient by the opium producers of India, Turkey, and Persia, where it is 'legitimate' to sell and transport these drugs in unrestricted quantities, regardless of their ultimate use by the purchaser; and

"Whereas the continuance of the sale and transportation of such drugs, without restriction on their use, results in the diversion of large quantities thereof into the channels of illegal international traffic and in the unlawful importation into the United States, and the sale here for unlawful purposes, of preparations made therefrom such as morphia, heroin, and cocaine; and

"Whereas the United States of America, in dealing with the traffic in habit-forming narcotic drugs within its own territory and possessions, notably in the Philippine Islands, and in coöperating sympathetically with the efforts of the Government of China in dealing with its opium problem, has always been committed, without regard to revenue, to a program for the complete suppression and prohibition of the production of and traffic in them, except for strictly medicinal and scientific purposes; Therefore be it

"Resolved, etc., that it is the imperative duty of the United States Government to safeguard its people from the persistent ravages of habit-forming narcotic drugs.

"Section 2. That the effective control of these drugs can be obtained only by limiting the production thereof to the quantity required for strictly medicinal and scientific purposes, thus eradicating the source or root of the present conditions, which are solely due to production many times greater than is necessary for such purposes.

"Section 3. That in the hope of accomplishing this end the President be, and he hereby is, requested to urge upon the Governments of Great Britain, Persia, and Turkey the immediate necessity of limiting the growth of the poppy (Papaver somniferum) and the production of opium and its derivatives exclusively to the amount actually required for strictly medicinal and scientific purposes.

"Section 4. That the President be, and he hereby is, requested to urge upon the Governments of Peru, Bolivia, and the Netherlands the immediate necessity of limiting the production of coca leaves (Erythroxylum coca) and their derivatives to the quantity exclusively required for strictly medicinal and scientific purposes.

"Section 5. That the President be, and he hereby is, requested to report to Congress on the first Monday in December, 1923, the result of his action."

In accordance with the above resolution, an official delegation consisting of Representative Stephen G. Porter, Bishop Brent, Surgeon General Blue, and Mr. Neville of the State Department as advisor, proceeded to Geneva to present its views to the Advisory Committee on Traffic in Opium of the League of Nations at the May meeting.

The Advisory Committee held its Fifth Session from May 24 to June 7, 1923, and the views of the American Delegation were presented in the form of the following proposals:

> "1. If the purpose of the Hague Opium Convention is to be achieved according to its spirit and true intent, it must be recognized that the use of opium products for other than medicinal and scientific purposes is an abuse and not legitimate."
>
> "2. In order to prevent the abuse of these drugs, it is necessary to exercise the control of the production of raw opium in such a manner that there will be no surplus available for non-medicinal and non-scientific purposes."

These proposals were examined and debated at great length by the Committee whose action on the matter was incorporated in Resolution 1 of the following resolutions passed by that body as the result of its deliberations: [34]

> "1. I. The Advisory Committee on Traffic in Opium accepts and recommends to the League of Nations the proposals of the United States representatives as embodying the general principles by which the Government should be guided in dealing with the question of the abuse of dangerous drugs and on which, in fact, the International Convention of 1912 is based, subject to the fact that the following reservation has been made by the representatives of the Governments of France, Germany, Great Britain, Japan, the Netherlands, Portugal and Siam:
>
> > " 'The use of prepared opium and the production, export and import of raw opium for that purpose are legitimate so long as that use is subject to and in accordance with the provisions of Chapter II of the Convention.'
>
> "II. The Advisory Committee, appreciating the great value of the co-operation of the Government of the United States of America in the efforts which the League has for the past two years been making to deal with the question of the abuse of dangerous drugs, expresses the belief that all the Governments concerned will be desirous of co-operating with that Government in giving the fullest possible effect to the Convention.
>
> "III. In bringing the American proposals to the notice of the Council and the Assembly, the Advisory Committee would recall that, during the two years that have elapsed since the Convention came into operation, it has worked toward the same ends by: (1) taking all possible steps to secure the adhesion of all countries to the Convention; (2) investigating the question of the world's needs of the manufactured drugs for medicinal and scientific uses with a view to the eventual limitation of the production of these drugs; (3) recommending the system of import certificates, arranging the exchange between States of information in regard to the illicit traffic in the drugs, and proposing other measures for securing international co-operation in suppressing that traffic; (4) inviting the Powers with territories in the Far East to review their requirements of opium, and submitting proposals for an investigation by the Chinese Government of the conditions in China, with a view to the more effective application of Chapter II of the Convention and the solution of the problem of the use of prepared

---

[34] Advisory Committee on Traffic in Opium and Other Dangerous Drugs. Report to Council on work of Fifth Session. May 24 to June 7, 1923.

opium in the Far East; (5) collecting and publishing information as to the measures taken to give effect to the Convention and the position generally in all countries in regard to the traffic, with a view to securing the enforcement of the Convention.

"IV. As a means of giving effect to the principles submitted by the representatives of the United States and the policy which the League, on the recommendation of the Committee has adopted, and having regard to the information now available, the Advisory Committee recommends to the Council the advisability of inviting:

"(a) The Governments of the States in which morphine, heroin or cocaine, and their respective salts are manufactured and the Governments of the States in which raw opium or the coca leaf are produced for export for the purpose of such manufacture;

"(b) The Governments having territories in which the use of prepared opium is temporarily continued under the provisions of Chapter II of the Convention and the Government of the Republic of China.

"to enter into immediate negotiations (by nominating representatives to form a committee or committees, or otherwise) to consider whether, with a view to giving the fullest possible effect to the Convention of 1912, agreements could now be reached between them:

"(a) as to a limitation of the amounts of morphine, heroin or cocain and their respective salts to be manufactured; as to a limitation of the amounts of raw opium and the coca leaf to be imported for that purpose and for other medicinal and scientific purposes; and as to a limitation of the production of raw opium and the coca leaf for export to the amount required for such medicinal and scientific purposes. The latter limitation is not to be deemed to apply to the production and export of raw opium for the purpose of smoking in those territories where that practice is temporarily continued under the provisions of Chapter II of the Convention;

"(b) as to a reduction of the amount of raw opium to be imported for the purpose of smoking in those territories where it is temporarily continued, and as to the measures which should be taken by the Government of the Republic of China to bring about a suppression of the illegal production and use of opium in China.

"Reservation by the Representative of the Government of India.

"The representative of the Government of India associates himself with the foregoing resolution, subject to the following reservation regarding paragraph I:

"'The use of raw opium, according to the established practice in India, and its production for such use are not illegitimate under the Convention.'

2. "The Advisory Committee, having regard to the large amount of detailed information now available, recommends the Council to invite the Powers with Far Eastern territories where the use of opium for smoking is temporarily continued in pursuance of Chapter II of the Opium Convention, to enter into immediate negotiations, by means of calling a special conference of representatives of these Governments, or otherwise, to consider what measures could be

taken to give a more effective application to Chapter II of the Convention and to bring about a reduction of the amount of opium used, and whether, on the lines of the suggestion set out below or on other lines, an agreement or understanding could not now be reached for the adoption of a uniform policy on the matter:

> "I. That the farm system, where it is still in operation, should be abolished and that the opium business should be made a Government monopoly and kept entirely in the hands of the Government.
>
> "II. As a corollary of paragraph I, that the retail sale of prepared opium should be made only from Government shops, and that all private shops should be abolished. Persons in charge of Government shops should be paid a fixed salary without any commission on the amount of business done, and therefore would have no temptation to push the sales.
>
> "III. That a uniform maximum limit should be fixed for the amount of prepared opium placed on sale for consumption, calculated according to the number of the adult Chinese male population, e.g., x taels per 10,000 adult Chinese males in the territory, and that the annual imports of raw opium should be limited to the amount required for that rate of consumption.
>
> "IV. That the possibilities of the system of registration, and licensing which has already been introduced in some of the Far Eastern territories, should be thoroughly explored.
>
> "V. That the possibility should be considered of making uniform, so far as circumstances permit:
>
> (a) the price at which prepared opium is retailed in the different territories, and
>
> (b) the penalties for infraction of the law in regard to the import, export, sale and use of prepared opium.
>
> "VI. That the interested Powers, that is, the Powers having territories in the Far East where the consumption of prepared opium is still permitted, should conclude an agreement among themselves to apply the foregoing measures for the purpose of carrying out Chapter II of the Convention.
>
> "VII. That the position should be generally reviewed periodically by the Powers interested and the question of further reducing the maximum limit fixed in the agreement should be considered.

3. "The Advisory Committee asks the Council to request the Governments to communicate their views as to the possibility of a total suppression of the manufacture of heroin or of its limitation to the minimum amount required.

4. "The Advisory Committee, being convinced of the great value of the information contained in the annual reports which each Government has been requested to transmit to the Secretariat, once more recommends the Council to urge on the Governments the importance of sending regularly to the Secretariat such reports, which should contain the fullest possible information, both with regard to the production of and the traffic in opium and other narcotics.

5. "The Advisory Committee recommends the Council to draw the attention of the Governments to the extreme desirability not only of direct communication to

other immediately interested Governments of the details of any seizures made, but also of a general communication to the Secretariat of the League of Nations of all important seizures in order that the fullest international publicity may be secured by the transmission, with the consent of the Governments concerned, of this information by the Secretariat both to other Governments not immediately concerned in the specific case and to the Press.

6. "The Advisory Committee recommends that the statement prepared by the Secretariat for the Sub-Committee on Customs Statistics, together with the memorandum prepared by Sir Malcolm Delevingne on the position of bonded warehouses in regard to the traffic in narcotics, should be communicated to the Governments with a request for their observations.

7. "The Advisory Committee, considering that the infliction of severe penalties on persons engaged in the illicit traffic in narcotics is one of the best means of preventing the spread of that traffic, recommends the increase of penalties in certain countries, the adoption of the penalty of imprisonment, and, if possible, of prohibition of residence (interdiction de séjour), a very strict application of the penalties laid down, and the introduction of clauses providing for the punishment of infraction committed in foreign countries."

Due to differences in opinion among its members, the Council at its July meeting decided to transmit the report of the Advisory Committee to the Assembly without comment.

The following resolutions represent the action taken by the Fourth Assembly, September 27, 1923: [35]

"Resolution 1.—The Assembly expresses its deep appreciation of the very valuable work done by the Advisory Committee on Traffic in Opium and other Dangerous Drugs, adopts its report and resolutions, taking note of the reservations contained therein, and asks the Council to take the necessary steps to put these resolutions into effect.

"Resolution 2.—The Assembly, in view of Turkey having agreed, by the Treaty of Lausanne, to adopt and to enforce the International Opium Convention of 1912, and in view of its importance as an opium-producing country, expresses the wish that the Turkish Government—on its ratification of the Convention and signature of the final Protocol of 1914—be invited to nominate a representative to serve on the Advisory Committee.

"Resolution 3.—The Assembly asks the Council to repeat its request to the Governments of Albania, Argentine, Colombia, Costa Rica, Lithuania, Paraguay, Persia and Switzerland that they should take all possible measures with a view to the prompt ratification and application of the Opium Convention.

"Resolution 4.—The Assembly, taking note with regret of the fact that a number of countries have not yet adopted the import certificate system as recommended by the Assembly in 1921 and 1922, reiterates the opinion expressed by the Assembly in 1922, that this system is the most practical method yet suggested for controlling the import and export of the drugs in accordance with the provisions of the International Opium Convention and that its success depends on its adoption by all countries engaged in importing or exporting the drugs; and in view of the serious difficulties created by the non-adoption, up to the present, of the system by several important countries, requests that the Advisory Committee may be instructed to proceed with the consideration of the suggestion contained in the second resolution adopted by the Assembly in 1922, and to report specially to the next Assembly on the whole situation.

---

[35] Journal of the Fourth Assembly. No. 23. September 28, 1923.

"Resolution 5.—The Assembly approves the proposal of the Advisory Committee that the Governments concerned should be invited immediately to enter into negotiations with a view to the conclusion of an agreement as to the measures for giving effective application in the Far Eastern territories to Part II of the Convention and as to a reduction of the amount of raw opium to be imported for the purpose of smoking in these territories where it is temporarily continued, and as to the measures which should be taken by the Government of the Republic of China to bring about the suppression of the illegal production and use of opium in China, and requests the Council to invite those Governments to send representatives with plenipotentiary powers to a conference for the purpose and to report to the Council at the earliest possible date.

"Resolution 6.—The Assembly, having noted with satisfaction that, in accordance with the hope expressed in the fourth resolution adopted by the Assembly in 1922, the Advisory Committee has reported that the information now available makes it possible for the Governments concerned to examine, with a view to the conclusions of an agreement, the question of the limitation of the amounts of morphin, heroin or cocaine and their respective salts to be manufactured; of the limitation of the amounts of raw opium and the coca leaf to be imported for that purpose and for other medicinal and scientific purposes; and of the limitation of the production of raw opium and the coca leaf for export to the amount required for such medicinal and scientific purposes, requests the Council, as a means of giving effect to the principles submitted by the representatives of the United States of America, and to the policy which the League, on the recommendation of the Advisory Committee, has adopted, to invite the Governments concerned to send representatives with plenipotentiary powers to a conference for this purpose, to be held, if possible, immediately after the conference mentioned in Resolution 5."

The following extracts taken from the minutes of this meeting are also of interest:

"The Assembly also suggests, for the consideration of the Council, the advisability of enlarging this conference so as to include within its scope all countries which are members of the League or Parties to the Convention of 1912, with a view to securing their adhesion to the principles that may be embodied in any agreement reached.

"M. Chao-Hsin Chu (China) pointed out that among the large producing countries only India had ratified the Convention of 1912, India had reduced the cultivation of the poppy, thereby losing about one-fifteenth of her revenue.

This work had been carried out by Lord Hardinge, in accordance with the Anglo-Chinese Treaty concluded through the good offices of Sir John Jordan.

"It was very necessary for all countries to come together and discuss how to control the production of opium for the use of the whole world.

"There was also the question of the manufacture of drugs, which under Article 9 of the Opium Convention should be limited to the amount required for legitimate use, i.e., medicinal and scientific use. This also was a subject for an international conference. The manufacture of dangerous drugs had increased during the ten years since the Opium Convention was concluded, and no Government should permit this excessive manufacture to continue. China had suffered more severely from the abuse of morphine than from the smoking of opium under the old regime.

"Opium-smoking was still legal in most Far Eastern colonies where Government monopolies for the sale of opium still existed, though under the Opium Convention such monopolies were only to be continued temporarily. Consumption of prepared opium in these territories had either increased or remained constant. Governments should impose any kind of taxation rather than resort to an opium monopoly.

"Rumours recently circulated in the Press to the effect that China was about to establish an opium monopoly were entirely false.

"Dame Edith Lyttelton (British Empire) said that the British Government strongly approved of the two conferences which had been arranged, and hoped they would take place as soon as possible. Complete co-operation between all the countries of the world would be necessary to suppress the trade in dangerous drugs and to suppress opium-smoking.

"In Great Britain the amount of drugs manufactured had been halved between the years 1920 and 1922, and one large firm which manufactured morphine had been deprived of its license.

"All countries should ratify the Opium Convention and insist upon import and export certificates.

"M. Francois (Netherlands) congratulated the Advisory Committee on the Traffic in Opium on its work, and in reply to its critics pointed out that the Opium Convention had only been concluded two years before the war.

"Countries should be distinguished according as the abuse of opium was of recent or of ancient date, and endeavor should be made to introduce progressively a uniform policy.

"The Dutch delegation approved the convening of a second Conference with the object of limiting the manufacture of dangerous drugs and the importation of raw opium to the quantities necessary for legitimate use. It was to be regretted that the Fifth Committee was presenting resolutions which were not quite in conformity with those of the Advisory Committee, and that it was proposed to extend to all the countries of the world, and not merely to the interested countries, the invitation to the Second Conference. It was to be hoped that the Council would not proceed upon these lines. The Dutch delegation also hoped that the question of the consumption of opium for eating purposes would not be raised, and that those participating in the Conferences should be allowed time to arrive at an understanding with their authorities in territories overseas.

"The City of The Hague would be very happy to serve as the seat of the next Conference if the City of Geneva were not preferred for financial reasons.

"The establishment of statistics was a very costly operation and the Netherlands delegation recommended the League of Nations to take into account the difficulties with which a large number of States had to contend.

"The Maharajah Jam Saheb of Nawanager (India) after congratulating the Advisory Committee on the Traffic in Opium upon its work, said that the Indian Government would continue to collaborate with the League of Nations in the campaign against the abuse of opium, but India could not consider as illegitimate the use of opium as a family drug. Opium in India was subject to a State monopoly, and its export was controlled by the Government.

"He had been asked by his colleague, M. Imam, to state that, contrary to general belief, the consumption of opium in India did not exceed the legitimate needs of the country, as the whole world might judge for itself.

"Prince Arfa-Ed-Dowleh (Persia) said that his country was happy to note that, thanks to the presence of the American delegates, the opium question had entered upon a practical stage. The peasants of the East would have to substitute some other form of profitable cultivation for the cultivation of the poppy. For this reason Persia had supported the American proposal for the convening of an economic conference.

"M. Reynald (France) asked whether it was better to eat opium than to smoke it. He recognized that there were in India habits and customs which must be taken into account. The French delegation, however, considered that the opium question must be studied in the broadest and most complete manner possible and that no method of consumption should be allowed to escape the control which was deemed to be indispensable.

"The collaboration of the United States in this field was very valuable as the United States gave appreciable help and showed that it took an interest in the work of the League of Nations."

At its meeting of December 13, 1923, the Council passed the following resolutions: [36]

"'1. The Council notes the adoption by the Assembly of the report [37] and resolutions of the Advisory Committee on Traffic in Opium and other Dangerous Drugs and the resolutions of the fourth Assembly. It instructs the Secretary-General to take all the action required by these resolutions and decides that the first conference, consisting of countries having possessions where the smoking of opium is continued, should be convoked at Geneva on the first Monday in November, 1924, and the second conference at Geneva on the third Monday in November, 1924.

"'2. The Council is convinced that the extension of the second conference to include all countries which are Members of the League or parties to the Convention of 1912 would result in a correspondingly wider acceptance of the principles embodied in any agreement reached. It therefore instructs the Secretary-General to invite to this conference all Members of the League or parties to the Convention of 1912.

---

[36] Minutes of the Twenty-Seventh Session of the Council. League of Nations Official Journal. February 1924.

[37] See Official Journal, August 1923, pages 1019-1027.

" '3. The Council instructs the Secretary-General to communicate with the Chairman of the Advisory Committee on Traffic in Opium with a view to calling an extraordinary meeting of the Advisory Committee on January 28th, 1924, for the purpose of nominating without delay a preparatory committee to be charged with the preparation of a draft programme for the second or larger conference to be held at Geneva. This Committee will consist of six members, including a representative of the United States and the two European assessors.

" 'Should the Chairman of the Advisory Committee deem it possible to make the necessary arrangements for nominating the members of the preparatory committee by correspondence without convening the Advisory Committee, the Council authorises him to do so, provided that no undue delay will be thereby caused.

" 'A draft arrangement on the traffic in opium should be considered and, if necessary, approved by the Advisory Committee before being forwarded either to each interested Government or to the conference.

" '4. The Council, feeling that the success of the conference depends on the co-operation of the Governments, instructs the Secretary-General to invite the Governments to make proposals for the carrying out of Assembly Resolutions 6, such proposals to be considered by the preparatory committee.

" '5. The Council instructs the Secretary-General to ask the various Governments their views as to the possibility of a total suppression of the manufacture of heroin or its limitation to the minimum amount required.

" '6. The Council instructs the Secretary-General to send periodical reminders to all Governments which have not sent in their annual reports.

" '7. The Council, associating itself fully with the views held by the Advisory Committee upon the extreme desirability not only of direct communication to other immediately interested Governments of the details of any seizures made but also of a general communication to the Secretariat of the League of all important seizures, instructs the Secretary-General to communicate Resolution 5 of the Advisory Committee to the Governments and to request them, on behalf of the Council, to give their favorable consideration to the recommendation of the Committee.

" '8. The Council instructs the Secretary-General to communicate to the Governments, with the request for their observations, the statement prepared by the Secretariat for the Sub-Committee on Customs Statistics, together with the memorandum prepared by Sir Malcolm Delevingne on the position of bonded warehouses in regard to the traffic in narcotics.

" '9. The Council requests the Secretary-General to communicate Resolution 7 of the Advisory Committee, which deals with increased penalties for persons engaged in the illicit traffic in narcotics, to the Governments, requesting them to give to it their earnest consideration.

" '10. The Council, recognising the necessity for the prompt ratification and application of the Convention by such Governments as have so far not ratified it, instructs the Secretary-General to repeat its request to these Governments to take all possible steps for the prompt ratification and application of the Opium Convention.

"'11. The Council is in agreement with the Assembly in taking note with regret of the fact that a number of countries have not yet adopted the Import Certificate System as recommended by the Assembly in 1921 and 1922. It reiterates the opinion expressed by the Assembly in 1922 and in 1923 that this system is the most practical method yet suggested for controlling the traffic in the drugs in accordance with the provisions of the International Opium Convention, and concurs with the view of the Assembly that its success depends on its adoption by all countries engaged in importing or exporting the drugs. In view of the serious difficulties created by the non-adoption of the system up to the present by several important countries, the Council instructs the Secretary-General to request the Advisory Committee to proceed with the consideration of the suggestion contained in the second resolution adopted by the third Assembly in 1922 and to report specially to the next Assembly on the whole situation.'"

In accordance with the resolution passed by the Council, the committee to prepare a draft program for the second Opium Conference was duly appointed. But in view of the inability of this committee to present one general plan, the Advisory Committee in its sixth session held August 4, to 14, 1924, decided "that a Sub-Committee, consisting of the members of the Preparatory Committee who were also members of the Advisory Committee and Dr. Anselmino and Mr. Campbell, should try once more to prepare a draft programme for that Conference."

The result of the work of the Advisory Committee is included in the following resolutions passed during its sixth session.[38]

"I. The Advisory Committee decides to transmit to the Council and to the Governments summoned to the second International Conference, as a supplement to the report of the Preparatory Committee, the series of measures attached hereto (Annexes 1 and 2), which, in the opinion of the Advisory Committee, furnish a satisfactory basis for the work of the Conference and may prepare the way for a final agreement.

"II. The Advisory Committee recommends that Powers having extraterritorial rights in China should, if they have not already done so, make regulations, the breach of which shall be punishable by adequate penalties, to control the carrying on by their nationals in China of any trade in the drugs to which Chapter III of the Opium Convention applies. The Committee further recommends that copies of such regulations be communicated to the Secretariat of the League.

"III. The Advisory Committee considers that, in view of the suggested measures of control to be submitted to the second International Conference and of the fact that the whole situation will be considered by that Conference, it would be better to postpone until next year the further consideration of the second resolution adopted by the Assembly of 1922.

---

[38] Advisory Committee on Traffic in Opium and Other Dangerous Drugs. Report to Council on the Work of the Sixth Session. August 4th to 14th, 1924. A. 32. 1924. XI.

"IV. With reference to the proposal of the Government of the Union of South Africa that Indian hemp (*Cannabis indica or Cannabis sativa*) should be treated as one of the habit-forming drugs, the Advisory Committee recommends the Council that, in the first instance, the Governments should be invited to furnish to the League information as to the production and use of, and traffic in, this substance in their territories, together with their observations on the proposal of the Government of the Union of South Africa. The Committee further recommends that the question should be considered at the annual session of the Advisory Committee to be held in 1925."

Annexes 1 and 2 above referred to in Resolution 1 are the following:

"Annex I.

Geneva, August 15th, 1924.

Measures Suggested by the Advisory Committee as a Basis for the Deliberations of the Second Conference, November 1924.

"Part 1.

"1. That each country shall furnish an estimate of its annual import requirements for medical and scientific purposes, whether for domestic consumption, manufacture or commerce, of

(a) Raw opium.
(b) Coca leaves.
(c) Morphine, its salts, and preparations containing morphine.
(d) Heroin, its salts and preparations containing heroin.
(e) Cocaine, its salts, and preparations containing cocaine.

"2. Each Government undertakes to refuse to authorize the importation into its territory of any of the substances mentioned in Article 1 beyond the quantities specified in the estimates furnished by it in pursuance of Article 1. The foregoing provisions shall not prevent the Government of a country, in which the use of opium for smoking purposes is still temporarily permitted under Chapter 2 of the Hague Convention, from authorising the importation of raw opium, in conformity with the provisions of Chapter 2 of the Convention, until such time as the use of opium for smoking purposes shall have been definitely prohibited.

"3. A permanent Central Board, composed of experts, shall be constituted by the Council of the League on the advice of the Opium Advisory Committee.

"4. The Governments agree to send to the Central Board:

(a) Their estimates of their annual import requirements in pursuance of Article I.
(b) Within three months after the end of each quarter, statistics of their imports from each country and of their exports or re-exports to each country during that quarter and, within three months after the end

of each half-year, statistics of their manufacture during that half-year, and, if possible, the stocks in the hands of wholesale dealers at the end of the half-year, of each of the substances mentioned in Article I.

(c) Within three months after the end of each year, the total quantity of each of the substances mentioned in Article I, consumed as such in the country during the year.

"The Central Board will communicate periodically to all Governments the position as regards the exports and re-exports to each country.

"Should it appear that the imports of any of the substances mentioned in Article I already received in any country during the current year have exceeded the amounts specified in the estimate furnished by that country, the Central Board shall call the attention of the Governments specially to the fact. Each Government undertakes not to export any further consignment of the substance in question to the said country during the same year, unless a revised estimate of its requirements shall have been furnished by the country.

"5. If any country furnishes no estimate of its requirements in pursuance of Article I or furnishes an estimate which appears to the Central Board to be greatly in excess of the reasonable requirements of the country and to be likely to be used in part for the illicit traffic, the Board shall fix the amounts of the reasonable requirements of that country after taking into account its population, climatic and hygienic conditions and all other factors which appear to the Board to be relevant, as well as any other special circumstances which the said country will be at liberty to submit to the Board. The Board shall notify the amount so fixed to all Governments. Each Government agrees not to allow the export to that country of amounts which, taken in conjunction with the exports from other countries, will exceed the amounts fixed by the Board.

"6. If any Government of any country which has commercial relations, in the matter of the substances mentioned in Article I, with a country for which an amount has been fixed by the Board in pursuance of Article 5 or Article 7, paragraph XIII, considers that it is undesirable to limit exports to the latter country to the amount so fixed, it shall have the right to demand that a special conference of all the countries which have such relations with the said country shall be summoned to consider whether such limitations or any other measure should be put into force.

"Part II.

"7. The provisions of the Hague Convention of 1912 shall be amended as follows:

"(I) Article 2 shall be extended to apply to coca leaves.

"(II) The following article (numbered 2bis) shall be added to the Convention:

"'Each Contracting Power shall require that a separate import license must be obtained for each importation of raw opium or coca leaves. The license may allow the importation of the amount for which the license is given in one or more consignments within a period to be specified in the license.'

"(III) Article 3 shall be replaced by the following article:

"Each Contracting Power shall require that a separate export license must be obtained for each exportation of raw opium or coca leaves. The Contracting Power, before issuing such license, shall require an import certificate, issued by the Government of the importing country and certifying that the importation is approved, to be produced by the person applying for the license. The license may allow the exportation of the amounts for which the license is given in one or more consignments within a period to be specified in the license. Unless a copy of the export license accompanies the consignment, the Government issuing the export license shall send a copy to the Government of the importing country. The Government of the importing country, when the importation has been effected, shall return the export license with an endorsement to that effect to the Government of the exporting country.

"'In the case of an application to export a consignment to any country for the purpose of being placed in a bonded warehouse in that country, the production of a special certificate from the Government of that country, certifying that it has approved the introduction of the consignment for the said purpose, may be admitted by the Government of the exporting country in place of the import certificate provided for above.'

"(IV) Article 5 shall be omitted.

"(V) The definition of cocaine in Chapter III shall be modified as follows: 'By cocaine is understood the principal alkaloid of the leaves of erythroxylon coca having the formula C_{17},H_{21},NO_4, whether extracted from the leaves of erythroxylon coca or produced by chemical synthesis.' (Ecgonine also to be included?)

"(VI) In Article 10 the words 'The Contracting Powers shall control' shall be substituted for 'The Contracting Powers shall use their best endeavors to control or to cause to be controlled,' and the words 'The Contracting Parties shall adopt' shall be substituted for 'The Contracting Powers shall use their best endeavors to adopt or cause to be adopted.'

"The words 'or shall make to the competent authorities an official declaration that they are so engaged' shall be omitted.

"The words 'This rule shall not necessarily apply to medical prescriptions and to sale by duly authorised chemists' shall be omitted.

"(VII) Article 12 shall be replaced by the following article:

"'Each Contracting Power shall require that a separate import license must be obtained for each importation of any of the substances to which Chapter III applies. The license may allow the importation of the amount for which the license is given in one or more consignments within a period to be specified in the license.'

"(VIII) Article 13 shall be replaced by the following article:

"'Each Contracting Power shall require that a separate license must be obtained for each exportation of any of the substances to which

> Chapter III applies. The Contracting Power, before issuing such licenses, shall require an import certificate, issued by the Government of the importing country and certifying that the importation is approved, to be produced by the person applying for the license.
>
> "'The license may allow the exportation of the amount for which the license is given in one or more consignments within a period to be specified in the license.
>
> "'Unless a copy of the export license accompanies the consignment, the Government issuing the export license shall send a copy to the Government of the country of importation.
>
> "'The Government of the importing country, when the importation has been effected, shall return the export license, with an endorsement to that effect, to the Government of the exporting country.
>
> "'In the case of an application to export a consignment to any country for the purpose of being placed in a bonded warehouse in that country, the production of a special certificate from the Government of that country certifying that it has approved the introduction of the consignment for the said purpose, may be admitted by the Government of the exporting country in place of the import certificate provided for above.'

"(IX) For the purpose of ensuring the full application and enforcement of the provisions of the Hague Convention, as amended by this agreement, in free ports and free zones, the Governments undertake to apply in free ports and free zones situated within their territories the same laws and regulations, and to exercise the same supervision and control in respect of the substance covered by the Convention, as amended by this agreement, as in other parts of their territories.

"(X) In the case of a consignment of any of the substances covered by the Convention as amended by this agreement exported from one country to another country, which passes through the territory of a third country without being removed from the ship or conveyance in which it is being conveyed except for the purpose of being transferred to another conveyance under the supervision of the authorities of the country of transit, a declaration shall be made to the authorities of the country of transit of the contents of the consignment and the country for which it is destined. If no declaration is made or a false declaration is made, the consignment shall be liable to confiscation by the authorities of the country of transit and the person making such false declaration shall be guilty of an offence.

"(XI) No transhipment of a consignment of any of the substances covered by the Convention as amended by this agreement shall be allowed unless the consignment is accompanied by an official copy of the export license, issued by the authorities of the country of export, or by an official copy of the import certificate, issued by the authorities of the importing country. It shall be made illegal for anyone in the country of transhipment to divert, or attempt to divert, the consignment to any destination other than that named in the official copy of the export license or import certificates above mentioned, without an export license from the authorities of transhipment.

"(XII) A consignment of any of the substances covered by the Convention, as amended by this agreement, which is landed in any country and placed in a bonded warehouse, shall not be allowed by the Government of that country to be withdrawn from the bonded warehouse to be sent out to another country unless an import certificate, issued by the Government of the country of destination and certifying that the importation is approved, is produced to the authorities of the former country. A special certificate shall be issued by the Government in respect of each consignment so withdrawn and shall take the place of the export license for the purpose of the preceding provisions of this agreement.

"(XIII) In the case of a country which is not a party to this agreement, the Governments undertake not to allow the export to such a country of any of the substances covered by the Convention as amended by this agreement except such amounts as may be fixed by the Central Board as being reasonably required for the medical and scientific needs of the country.

"Part III.

"The Conference makes the following recommendations:

"1. That each Government should forbid any person within its jurisdiction from procuring or assisting the commission, in any place outside its jurisdiction, of any offense against the laws in force in such place for controlling or regulating the manufacture, sale, use, export or import of any of the substances covered by the Convention as amended by this agreement, and that any person knowingly violating such prohibition shall be liable to punishment.

"2. That each Government should forbid the conveyance in any ship sailing under its flag of any consignment of the substances covered by the Convention as amended by this agreement:

> "(1) Unless an export license has been issued in respect of such consignment in accordance with the provisions of the Convention so amended and the consignment is accompanied by an official copy of such license;
>
> "(2) To any destination other than the destination mentioned in the license."

"Annex 2.

"Note-explanatory of the Proposals contained in Document O. C. 216 (5).

"The measures suggested as a basis for discussion consist of two parts. The first part consisting of Article 1 to 6 contains a scheme the object of which is to limit the exports and imports of the drugs and of the raw materials from which they are manufactured to the amounts required for medical and scientific purposes. It has not been thought necessary at the present stage to work out the scheme in full detail, but the essential features are set out in Articles 1 to 6, and Article 7, paragraph XIII. Each country which becomes a party to the agreement will prepare at, or shortly before, the commencement of each calendar year an estimate of the amounts of each of the raw materials or of the manufactured drugs which it will require to import during the year:

(a) For consumption in the country for medical and scientific purposes;
(b) For the manufacture of the drugs or of other medical preparations;
(c) For the export trade.

"Each country will undertake that it will not import more of the raw materials or of the manufactured drugs than it specifies in its estimates.

"The estimates will be sent to a Central Board established in the manner proposed in the scheme.

"The Governments will also send periodically to the Central Board statistics of their imports and exports, their manufactures, and their consumption of the raw materials and of the drugs.

"These statistics will enable the Central Board to follow the course of the International traffic, so that whenever it appears that the exports to or imports into any country have exceeded the amounts of the estimates furnished by that country, it will be in a position to notify the Government of that country, and the Governments of other countries, of that fact.

"It is intended that the scheme should be worked in as elastic a manner as possible. In the first place, it is not expected that in the early years it will be possible to give exact estimates. At first, the estimates will in many cases necessarily be approximate only, and some margin will have to be allowed for errors in estimation. As experience is gained, the estimates will become more and more precise. In the second place, the estimates furnished by a Government at the commencement of a year will not necessarily be the final estimates for the year. If the estimates should be found by the Government in the course of the year to be insufficient, it will be open to the Government to furnish revised estimates to the Central Board. Or, again, the production of the raw materials will vary from year to year according to the state of the crops. In a year of abundant crops, when prices are low, the manufacturing countries will desire to take advantage of the state of the market and lay in supplies for the future. It will, again, be open to the Governments of such countries to revise their estimates of the supplies of the raw material required during the current year, a corresponding reduction being made in the estimates of the following year.

"The experience of the Advisory Committee shows that it has to be anticipated that some countries will not become parties to the agreement, at any rate, not at first, or that they will neglect or declare themselves unable to frame any estimates of their requirements. It may be also that in some cases supplies will be demanded which are greatly in excess of the legitimate requirements of the country and which might serve to supply the illicit trade in the drugs.

"It is therefore provided (Articles 5 and 7, paragraph XIII) that in such cases the Central Board shall have the power to fix the amounts which are reasonably required for the medical and scientific needs of the country, after taking into account all proper considerations, such as population, climate, etc., and any special circumstances which the country in question may desire to submit to the Board. The amounts so fixed will be notified to all Governments by the Central Board and the Governments will undertake to limit their exports to that country so that the amounts fixed by the Board shall not be exceeded. As explained above, Governments will be informed by the Central Board when the amounts fixed have been reached.

"It has been suggested that political considerations may sometimes make it undesirable for a particular Government or Governments to limit its exports to a country in a case of this kind. To meet this difficulty, it is provided in the scheme that such a Government or Governments may ask for a special conference of the countries trading in the drugs with the country in question to consider whether the limitation should be enforced or some other measures taken.

"It will be noticed that Article 1 provides only for estimates of *imports* being furnished. Some countries, however, provide themselves with their requirements of the drugs from their own manufactures, and the estimates furnished in pursuance of Article 1 will, therefore, not give the total requirements of the amounts needed for medical and scientific purposes. It is desirable, however, that the total requirements should be known. If the total requirements of all countries are known, it will be possible to compare the estimates of one country with those of another and so to reach some kind of standard for countries having similar conditions. The total amount of the drugs required to be manufactured to meet the world's medical and scientific needs, and the total amount of raw materials required to be produced, will also be known, and this knowledge should help to stabilise the manufacture of and trade in the drugs.

"The second part contains a number of provisions designed to strengthen and give greater precision to the provisions of the Hague Convention, and, in particular, those which relate to the control over the exports and imports of the substances to which the Convention applies. Experience during the three years which have elapsed since the Convention came into force has shown that there are loopholes in the existing provisions by which persons engaged in illicit traffic can evade the control over the national and international trade in the materials and drugs which was the object of the Convention, and that a stricter control must be established if that object is to be secured effectively.

"It is accordingly proposed: (1) that a separate license from the Government shall be required for each consignment imported or exported; (2) that an export license shall only be issued by the Government of the exporting country on the production of a certificate from the Government of the importing country that the importation of the consignment is approved (to avoid unnecessary interference with trade, this certificate can be given on telegraphic instructions from his Government by a diplomatic or consular officer of the importing country stationed in the exporting country); (3) that a copy of the export license shall either accompany the consignment or be sent by the Government of the exporting country to the Government of the importing country, and that when the importation has been effected this copy shall be returned, with an endorsement to the effect that the importation has been effected, to the Government of the exporting country.

"The first two of these proposals are already being enforced by many Governments. The third is intended as a preventive against diversion of the consignment *en route* for illicit purposes.

"Provisions are also proposed to ensure that materials or drugs which are brought into free ports or free zones do not escape control and that transshipment facilities are not utilised for the purpose of diverting consignments, without authority, to a destination other than that for which the export license has been issued. Special arrangements are suggested for safeguarding the 'entrepôt' trade as carried on by means of bonded warehouses.

"Other proposals are that the coca leaf, which is the raw material of cocaine, shall be brought within the Convention, and that the definition of cocaine shall be extended to cover artificial cocaine produced by chemical synthesis.

"Finally, the Advisory Committee has appended two recommendations for the consideration of Governments.

"The first of these is based on a provision in the British law which has been found extremely useful in dealing with illicit traffickers, who, while residing in one country, organise or arrange for illicit transaction in another country.

"The second is intended to meet a very serious difficulty which is caused at present by the lack of any control over the exports from certain producing countries. Large consignments of raw opium without any restriction are being exported to the Far East under false declarations of destination for the purposes of the illicit traffic, and are being smuggled into China and elsewhere. It is accordingly proposed that Governments should exercise a control over the conveyance of opium or the other materials or drugs in ships sailing under their flag."

The following resolutions passed by the Mixed Sub-Committee of the Health Committee and of the Advisory Committee on Traffic in Opium at its Second Session September 5-7, 1923, also were noted by the Advisory Committee at its meeting:

"I. For the purpose of determining the legitimate needs of the various countries as regards narcotic drugs, the Mixed Sub-Committee, after having examined the figures forwarded by the Secretariat, gives it as its opinion that the correspondence existing between these data was sufficiently close to allow of a preliminary approximate figure representing medicinal and scientific needs being fixed forthwith in regard to opium and all its derivatives, including the quantities of opium converted into codein and other products. This figure of 600 milligrammes (about 10 grains) of raw opium per head per year should, however, be considered as a maximum. In view of the variable amount of raw opium in morphine this figure has been calculated by taking a content of 10 per cent as an average. As regards cocaine, the Mixed Sub-Committee regrets that the data which it has received are not sufficient to enable it to take steps at present to find a similar figure.

"If the States should consider it necessary to undertake new enquiries as regards their respective needs, the Mixed-Sub-Committee recommends the application of a method consisting in utilizing the information furnished directly by hospitals, pharmacists and practitioners, pointing out, however, that this method will give accurate results only if the narcotics are prescribed on special forms. The Mixed Sub-Committee points out again that, in view of the large quantities of codein prescribed in certain countries, it would be well to include this alkaloid in the enquiries and, in general, all the derivatives of opium employed in therapeutics.

"II. Diacetyl-morphin (heroin) is a very dangerous drug, still more toxic than morphine and still more dangerous as regards the forming of a drug habit. Since the pharmacologists and clinical practitioners admit that heroin can be dispensed with in therapeutics, the Mixed Sub-Committee recommends that the possibility of entirely forbidding its manufacture should be considered.

"III. In the present stage of our knowledge of therapeutics, cocaine cannot always be replaced by its substitutes, but the Mixed Sub-Committee is of the opinion that its use should be limited to those branches of medicine where it is indispensable, namely, laryngology and ophthalmology, and that in particular the possibility of its prohibition in the practice of dentistry should be considered. Furthermore, the Mixed Sub-Committee is of opinion that the use of cocaine should not be left to patients. It also considers that the sale of patent medicines containing cocaine should only be permitted on a doctor's prescription.

"Finally in order to prevent contraband and illicit traffic and in order to facilitate supervision, the Mixed Sub-Committee is of opinion that the sale of cocaine should only be permitted in the form (sterilised) solutions.

"IV. At present the provisions of the Hague Convention are not applicable to preparations containing less than two-tenths per cent of morphine and less than one-tenth per cent of heroin or cocaine.

"The Mixed Sub-Committee believes that these provisions may to a certain extent facilitate illicit traffic in narcotic drugs on account of the fact that it will always be possible to distil a pure solution of one of these narcotic drugs and to recover in this way a considerable quantity of the drug, which would thus escape all supervision. The Sub-Committee ventures to call the attention of the Advisory Committee on Opium to this fact.

"V. The French Government, in accordance with a decision of the Second Assembly of the League of Nations, has submitted to the Secretariat a list of the derivatives of morphine and of cocaine, which in its opinion have the same harmful effects as the drugs mentioned by the Hague Convention.

"The Mixed Sub-Committee, having taken note of this communication, is of opinion that the provisions of the Convention should not be applied to these products, with the exception of those derived from ecgonin, namely:

Ethylbenzoylecgonin or ethylic coca,
Propylbenzoylecogonin,
Butylbenzoylecgonin,
Cinnamylecocaine.

"Dionin and peronin are products not widely used, which have an action similar to that of codein, and which, as far as experience has shown, do not produce the condition of euphoria which leads to addiction. There is, therefore, no need to fear their abuse. Apomorphine and eupomorphine are not narcotics, but powerful emetics.

"As regards artificial cocaine, the Mixed Sub-Committee has taken note of the decision adopted by the Advisory Committee at its third session, according to which cocaine should be defined by its chemical formula and not by its origin, with the result that artificial cocaine thus comes under the provisions of the Convention.

"As regard the substitutes for cocaine mentioned in the list, they have nothing in common with cocaine except their anesthetic action, and do not produce the excitation of the central nervous system which leads to abuse. With the exception of novocain, which has made the use of cocaine for local anesthesia almost superfluous, the other products mentioned are very seldom used on account of their injurious accompanying effects on the patient.

"VI. The Mixed Sub-Committee considers it necessary that the States should forward periodically to the Secretariat of the League of Nations a list of the new derivatives of opium and of cocaine which in their opinion are liable to have the same injurious effects as the products mentioned in the Hague Convention and which should consequently be brought under its provisions.

"Finally, the Mixed Sub-Committee adopted the following decisions which are communicated to the Advisory Committee.

"VII. The Advisory Committee on the Traffic in Opium and the Health Committee having appointed a Mixed Sub-Committee entrusted with the examination of certain medical problems concerning narcotic drugs, it would be useful if this Sub-Committee should meet during the sessions of the Advisory Committee in order that the latter might be able to consult it on questions within its competence.

"Consequently, the Mixed Sub-Committee requests its Chairman to take all the necessary steps to give effect to this recommendation.

"VIII. The Mixed Sub-Committee decides to appoint Professor Knaffl-Lenz as expert on the Committee."

The Health Committee of the League of Nations, however, did not agree with the Mixed Sub-Committee and passed on February 15, 1924, the following resolution:

"'The Health Committee,

"'Having taken note of a report on the work of the Mixed Sub-Committee on Opium and of the enquiries which it has set on foot with a view to determining the legitimate requirements of the various countries of opium and opium derivatives, it being understood that legitimate requirements are to be taken as meaning medical and scientific requirements alone:

"'Notes that it is impossible, with the data now available, to determine accurately any figure representing legitimate requirements;

"'Considers that, in fact, the estimate of 600 milligrammes of raw opium per head per annum adopted by the Mixed Sub-Committee considerably exceeds the quantities necessary for those requirements;

"'And considers that this estimate ought to be reduced to 450 milligrammes, it being understood that this figure represents a maximum and that, as it has been established solely on the basis of the estimates given by countries which have a highly developed system of medical aid, it can only be applied to countries in which similar conditions exist.

"'The Committee further considers that, since this figure is required essentially, in order to arrive at a reduction in the world production of opium and the manufacture of its derivatives, it should be regarded exclusively from this point of view and not as a guide to the legitimate consumption of any given country.'"

This committee offered, further, the following:

"Justification for the Maximum Figure of 450 Mg. of Raw Opium per head, proposed by the Health Committee at its Session held from February 11th to 21st, 1924, as being sufficient for Medicinal Requirements in Countries in which the Health Service is well Organized.[39]

"At its session held in March, 1924, the Preparatory Committee on Opium decided to request the Health Committee to furnish more detailed information with regard to the average quantity of 450 mg. of raw opium per head, which had been proposed in the case of countries which possessed a modern health organisation, and also to indicate separately the requirements with regard to morphine and heroin. At the same time, the desire was expressed that these estimates should be drawn up upon a wider basis and that the maximum requirements in cocaine should also be given.

"During the short time at its disposal, the Health Section endeavoured to collect reports concerning the amounts used in general hospitals and by sick-benefit clubs *(Krankenkassen)*. All the reports received up to the day upon which the Sub-Committee met, that is September 19th, have been used in drawing up the attached tables.

"The maximum quantity proposed has been arrived at on the following basis:

"1. The reports received up to the present from several European countries with regard to the estimates of their annual requirements.

"2. The amounts used by sick-benefit clubs.

"3. The amounts used in general hospitals.

"1. Table V.

"The estimates received from seventeen European States (contained in Document P. C. O. I. [I] have been used in drawing up the table. In the case of Denmark and of Austria, it was possible to make use of more recent and more correct estimates.

"The figures relating to Switzerland have not been taken into account, the Director of the Federal Service of Public Health being of opinion that they did not represent actual requirements. The figures communicated by Belgium and Denmark represent the actual amounts used in those countries and should not therefore be considered as estimates, as is the case with regard to the other countries; these figures, therefore, are of special importance.

---

[39] League of Nations. Health Committee. Minutes of Third Session. September 29, October 4, 1924. Document C. 588 M. 202. 1924 II.

"In all the tables the figures are indicated in equivalents of raw opium and basic cocaine. With regard to salts of morphine and their derivatives, an estimate of the quantity of raw opium has been obtained by taking as a basis the quantity of basic morphine which would have been necessary—theoretically—in the preparation of the quantities of the derivatives and multiplying it by ten. The proportion of raw opium has been fixed at 10 per cent merely in view of the fact that this maximum figure is not reached in manufacture, and during the process of re-crystallisation a further loss of several units occurs. Opium used in the production of morphine shows an average proportion of 13-14 per cent of morphine. The loss occurring in manufacture would seem therefore to have been fully taken into account.

"The equivalents of raw opium obtained in this manner for morphia, heroin and codeine do not correspond to the amounts arrived at by the Opium Section (Document P. C. O. I. [1]). The calculations made by the latter were not carried out on a uniform system. In the case of morphine and codeine, no discrimination was made between basics and salts and therefore the equivalent values indicated in the document quoted above are generally from 20 to 30 per cent too high. The average amounts calculated in the manner stated, in respect of the 16 European States with a total population of 250,000,000, as shown in Table V, give the requirements of raw opium as follows:

"For medicinal opium . . . . 113 mg. i.e. 39%
" morphine . . . . 155 " " 53.4%
" heroin . . . . 17 " " 16%

a total of 290 mg. per inhabitant.

"Requirements with regard to codeine have only been mentioned by six States, and amount to 46 mg. per head, that is 25.5 per cent of the total consumption in the said countries. In view of the fact that among these six States there are some in which the total opium requirements are considerably less,[40] this estimate must be considered as being too low for the other countries, and should be doubled. The average figure of 380 mg. per head, including codeine, would therefore represent European requirements. This average figure is only exceeded to an appreciable extent by England and Sweden. The requirements of these two countries—codeine not included—amount to 547 mg. (England) and 608 mg. (Sweden). (In the figures furnished by England it is not quite clear whether codeine is included or not.)

"2. Tables I, II and III.

"Amount used by Sick-Benefit Clubs *(Krankenkassen)*.—Up to the present only three reports have been received with regard to the amount used by the sick-benefit clubs, the investigations not having been concluded at Warsaw. In 1923, the amount used by the Federal Austrian *Krankenkasse,* to which all the State officials belong, from office-boy to Minister, as well as the members of their families, gives a good idea of the actual requirements of the population, in view of the fact that the estimate of consumption also includes the quantities of morphine prescribed by doctors for drug-addicts. The total quantity, including codeine, amounted in 1923 to 360 mg. of raw opium per insured person; to this quantity should be added the amount needed for scientific and veterinary requirements, which in Austria is estimated at 25 to 30 mg. per inhabitant. Although the consumption of codeine by this *Krankenkasse* is double the average consumption of the population, the quantity required would not, however, appear to be higher than the average estimate for the requirements of Europe.

---

[40] "The average total consumption in these six countries does not exceed 181 mg."

"On the other hand, the figure relating to consumption by the Basle *Krankenkasse,* to which 50 per cent of the population belong, appears to be notably less, namely 230 mg. per head. Whereas the Austrian *Krankenkasse* uses 71.6 per cent of its raw opium in the form of codeine, that in Basle consumes only 37 per cent; therefore it requires a proportionally larger amount of morphine and heroin. Given the fact that, in order to attain an equal therapeutic effect, three to four times more codeine is required than morphine and six times more codeine than heroin, if the Basle *Krankenkasse* substituted the use of codeine for that of morphine and heroin, its total consumption would equal that of Austria.

"On the other hand, the quantities consumed by the three German *Krankenkassen* during the first half of 1923 were notably higher. Unlike the *Krankenkassen* of Basle and Austria, the German local and rural *Krankenkassen* do not include members of families. It is, therefore, merely a question of adult requirements. Under the terms of a State Law, disabled soldiers have been affiliated to *Krankenkassen.* That among these disabled soldiers there are a large number of drug-addicts is proved by the fact that, on the average, 0.15 g. of morphine per prescription have been ordered by the local *Krankenkasse,* notwithstanding the fact that the number of women members is double that of the male members.

"Industrial *Krankenkassen* include workmen belonging to industrial enterprises; the number of patients is high. This is proved by the number of days of hospitalisation. With regard to the rural *Krankenkassen,* which also include only adult members, the consumption corresponds to the average proposed of 450 mg. of raw opium.

"For the reasons given above, the consumption by these three German *Krankenkassen* cannot be taken as a basis for estimating the requirements of the total population.

"3. Table IV.

"With regard to the average requirements in general hospitals in Belgium, Poland, Austria, Germany and Basle, the figures total 65 mg. per day during hospital treatment. Austria and Germany alone differ from this average.

"The Austrian figures are lower. The statistics of the Graz Provincial Hospital date from the year 1922, in the course of which, for reasons of economy, the prescription of medicaments was reduced as far as possible. The amount used by the General Hospital in Vienna for the period extending from June 1st, 1922, to June 30th, 1923, works out to an average of 54 mg.

"The German figures exceed the average; they have been furnished by two hospitals in which consumption has probably been larger than in other general hospitals.

"These statistics show that the consumption of opium in countries differing climatically and racially is about equal, provided the health organisation in those countries is equally developed.

"There is sufficient reason, therefore, for applying the average figure arrived at in respect of the 16 European States mentioned above to the other States of Europe which have not so far furnished reports.

"From the medical point of view, the subdivision of the total consumption into medicinal opium, morphine, heroin, and other derivatives, as desired by the Committee on Opium, is not of great value.

"The consumption of morphine, for instance, may very well show a decrease compensated for by an increase in the consumption of opium, in view of the fact that the different alkaloids contained in opium and offered as specialised products under the name of pantopon, pavon, omnopon, etc., containing 50 per cent of morphine, are in some cases more valuable from the therapeutic point of view than morphine. As regards the substitution of one preparation for another, the question of price is, in the first place, the determining factor. The total quantity of opium required would not change—it would be more likely to increase—if the use of codeine had to be substituted for that of morphine and heroin.

"The average consumption of cocaine in 13 states of Europe, with a total population of 222 millions, is, in round figures, 7 mg., but consumption by the Austrian and Basle *Krankenkassen* amounts to 3 mg. The German *Krankenkassen,* however, require rather more than the European average quoted above.

"In the hospitals the daily average during treatment is 3.2 mg.; the Austrian and German averages are the only ones which differ with regard to these figures. The notably higher consumption in Austria is explained by the fact that the Laryngological Clinic in Vienna treats a large number of out-patients, and the quantities used for the latter are included in the figure given above. The same, no doubt, holds good in the case of Germany.

"A maximum of 7 mg. per head annually of cocaine should, therefore, be fixed as representing the requirements of European States. The quantity actually necessary, however, will show great fluctuations in view of the fact that the substitution for cocaine of other preparations such as novocaine, tutokain, etc., frequently depends on the question of price.

"The averages which have been laid down for Europe, i.e., a maximum of 450 mg. for raw opium and 7 mg. for cocaine per head per year, cannot serve as a basis for fixing the total of universal requirements, since in countries in which the health organisation is not well developed the consumption is very much smaller. For this reason, the requirements in raw opium in the British Colonies (in Africa, the Seychelles, Southern and Northern Rhodesia, Sierra Leone, Swaziland, Nigeria and the Sudan), with a population of about 18 million inhabitants, do not exceed 25 mg. of raw opium and .04 of basic cocaine annually per head. For the purpose of fixing the amount of world requirements, an average should be established for each Continent.

"(Signed) E. Knaffl-Lenz."

The following resolutions were passed by the Assembly on September 20, 1924:

"1. The Assembly expresses its deep appreciation of the very valuable work done by the Advisory Committee on Traffic in Opium and other Dangerous Drugs, and adopts its report (Document A. 32. 1924. XI), together with the resolutions embodied therein.

"2. The Assembly expresses its satisfaction that the Advisory Committee has been able to work out a series of measures which, although they have not each of them received the approval of all of its members, were considered by the Committee to furnish a satisfactory basis for the work of the second of the International Conferences to be held in November 1924 and to prepare the way for a final agreement, and expresses the hope that the result of the work of the two International Conferences will lead to a solution of the great and difficult problems which each Conference, according to the resolutions of the fourth Assembly will be called upon to consider.

"3. The Assembly, taking note of the measures adopted by the Swiss Federal Council and legislative powers for ratifying and giving effect to the provisions of the Hague Convention, and bearing in mind the importance of Switzerland as a manufacturer of the drugs to which Chapter III of the Convention applies, expresses the hope that, as soon as the necessary steps have been taken to put into actual effect in Switzerland the provisions of the Convention, the Council of the League will invite the Federal Council to nominate a representative to take part in the work of the Advisory Committee.

"4. The Assembly regrets to note that the more thorough investigations which the Chinese Government in 1922 undertook to carry out with regard to the cultivation of the poppy in China have not, even in the opinion of the Chinese Government itself, yielded adequate and satisfactory reports; and views with the utmost concern the continued production of opium which is now going on in China. The Assembly records its sense of the unsatisfactory character of the official investigations which have been made and of the official reports which have been furnished to the League, and approves of the recommendation of the Advisory Committee that the aid of public opinion should be enlisted through the medium of the Far Eastern Press in an endeavour to solve this grave problem.

"5. The Assembly requests the Council to be good enough to ask the Advisory Committee on Traffic in Opium and other Dangerous Drugs whether it considers it desirable and expedient that the work undertaken by the League of Nations in connection with the traffic in opium, under Article 23 of the Covenant, should be completed by the preparation of a scheme of propaganda to acquaint the masses with the terrible consequences resulting from the use of dangerous drugs, and thereby to restrict the consumption of such drugs. Should the Advisory Committee be of opinion that it is desirable and expedient to prepare such a scheme, the Assembly requests the Council to submit the scheme to it at its next session, and to indicate what measures are required in order to carry it into effect.

"6. The Assembly, in the interest of the work of the Advisory Committee on Traffic in Opium and other Dangerous Drugs and in order to make this work more effective, expresses a wish that the Council may take the necessary steps to ensure that a member belonging to one of the Latin-American countries be appointed to this Committee."

In accordance with the resolution adopted by the Assembly of the League on September 27, 1923 and the subsequent activities, the First International Opium Conference to consider the application in the Far East of Chapter II of the Hague Convention was convened at Geneva on November 3, 1924. The Agreement, Protocol and Final Act resulting from this Conference was signed on February 11, 1925. The text of these instruments is contained in Appendix II.

The Second International Opium Conference was convoked in accordance with a resolution of the Assembly dated September 27, 1923 and met on November 17, 1924 to consider the question of the limitation of the amounts of morphin, heroin, or cocain and their respective salts to be manufactured and the limitation of the production of raw opium and coca leaves. During this conference the delegation from the United States found themselves out of sympathy in regard to certain points and finally withdrew on the basis of the following memorandum sent by Representative Stephen G. Porter, head of the delegation, to M. Zahle, president of the Second Conference:

"The League of Nations on October 18, 1923, extended an invitation to the Powers signatory to The Hague Convention, including the United States, to participate in an international conference which was called for the purpose of giving effect to the following principles, subject to reservations made by certain nations regarding smoking opium:

" '1. If the purpose of The Hague Opium Convention is to be achieved according to its spirit and true intent it must be recognized that the use of opium products for other than medical and scientific purposes is an abuse and not legitimate.

" '2. In order to prevent abuse of these products it is necessary to exercise the control of the production of raw opium in such a manner that there will be no surplus available for non-medical and non-scientific purposes.'

"The joint resolution, adopted by the Congress of the United States on May 15, 1924, authorizing our participation in the present Conference, quoted the principles referred to in the preamble and expressly stipulated '—that the representatives of the United States shall sign no agreement which does not fulfill the conditions necessary for the suppression of the narcotic drug traffic as set forth in the preamble.'

"Despite over two months of discussion and repeated adjournments, it now clearly appears that the purpose for which the conference was called cannot be accomplished. The reports of the various committees of the Conference plainly indicate that there is no likelihood under present conditions that the production of raw opium and coca leaves will be restricted to the medicinal and scientific needs of the world. In fact the nature of the reservations made show that no appreciable reduction in raw opium is to be expected.

"It was hoped that, if the nations in whose territory the use of smoking opium is temporarily permitted, would, in pursuance of the obligation undertaken under Chapter II of The Hague Convention, adopt measures restricting the importation of raw opium for the manufacture of smoking opium, or would agree to suppress the traffic within a definite period, such action would materially reduce the market for raw opium, and an extensive limitation of production would inevitably follow.

"Unfortunately, however, these nations, with the exception of Japan, are not prepared to reduce the consumption of smoking opium unless the producing nations agree to reduce production and prevent smuggling from their territories, and then only in the event of an adequate guarantee being given that the obligations undertaken by the producing nations would be effectively and promptly fulfilled. No restriction of the production of raw opium under such conditions can be expected.

"In the matter of manufactured drugs and control of transportation, an improvement over The Hague Convention is noticeable. There is, however, no likelihood of obtaining complete control of all opium and coca leaf derivatives. Irrespective of the measure of control provided for manufactured drugs, it is believed that, by reason of the very small bulk, the ease of transportation with minimum risk of detection and the large financial gains to be obtained from their illicit handling, such drugs and their derivatives can only be effectively controlled if production of raw opium and coca leaves, from which they are obtained, is strictly limited to medical and scientific purposes. This the Conference is unable to accomplish.

"In the circumstances the Delegation of the United States, in pursuance of instructions received from its Government, has no alternative under the terms of the Joint Resolution authorizing participation in the conference other than to withdraw, as it could not sign the agreement which it is proposed to conclude. We desire to make it clear that our withdrawal from the present Conference does not mean that the United States will cease its efforts through international cooperation for the suppression of the illicit traffic in opium and other dangerous drugs. The United States recognizes that the world-wide traffic in habit-forming drugs can be suppressed only by international cooperation, but believes that for the present, at least, greater strides in the control of the traffic may be hoped for if it should continue to work toward this end upon the basis of The Hague Convention of 1912. February 6, 1925."

The Conference, regretting the withdrawal of the United States delegation, proceeded with its deliberations which led to the signing of a Convention on February 19, 1925. The text of the Convention, Protocol and Final Act of the Second Opium Conference may be found in Appendix III.

Following the signing of the International Opium Convention of

1925, the Council passed the following resolutions during its session of March 9-14, 1925:

"I. The Council authorizes the Secretary-General to make the necessary communications provided for in Articles 33 and 35 of the Convention, so as to enable the competent authorities to sign or to accede to the Convention on behalf of the following countries or the necessary measures to be taken for the application of the Convention in those countries:

Afghanistan
Andorra
Ecuador
Hedjaz
Iceland
Liechtenstein
Mexico
Monaco
Union of the Socialist Soviet Republics
San Marino
Soudan

"II. The Council asks the health committee of the League of Nations to consider immediately whether it would be expedient to consult the Office International d'Hygiène Publique regarding the products mentioned in Articles 8 and 10 of the International Opium Convention of 1925 in order that if so, a decision concerning preparations which cannot give rise to the drug habit and a recommendation concerning all other drugs which might come under the provisions of the Convention may be notified immediately upon the entry into force of the said convention."

The seventh session of the Advisory Committee was held in August, 1925, at which time the following resolutions were passed:[41]

"I. (i) The Committee desires to call the attention of the Council and the Assembly to the prevalence of the illicit traffic in the drugs at the present time, its organised character and the large financial resources behind it, as indicated by the documents laid before the Committee and appended to its report.

"(ii) Its examination of these reports and of the action taken by various Governments as indicated in the reports leads the Committee to urge, in amplification of its previous recommendations on the subject,

"(a) That in all cases in which illicit transactions are discovered or suspected the most energetic steps should be taken by the Government to follow up every clue which may lead to the discovery of the persons engaged in the traffic.

"(b) That any information pointing to the complicity of any person or persons in another country should be *immediately* communicated to the Government of that country with a view to similar investigations being made. (The recommendations made by the Committee in 1922 and 1923 have, in many cases, not been acted upon by the Governments.) A report of the results of the investigations should be sent to the Government communicating the information (and to the Secretariat of the League in any case in which the communication is made through the Secretariat.)

---

[41] Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the work of the seventh session. Geneva. Aug. 24 to 31, 1925.

"(c) That the particulars so communicated should be as full as possible and should include in particular, if known, a description of the packages and the *marks* on the packages, the names and addresses of the consigner and consignee, the names and addresses of any agents through whom the goods have passed, the place from which the goods were despatched, the date on which they were despatched, the name of the ship (or description of the route) by which they were despatched, etc., etc. Specimens of the containers and labels should also be sent.

"(iii) The Committee would also lay great stress on the importance of discovering the sources from which the supplies are obtained by the illicit traffickers and of dealing severely with firms of licensed manufacturers and dealers who are found to be knowingly supplying drugs for the illicit traffic. In the opinion of the Committee, the most effective method of dealing with such manufacturers and dealers is to deprive them of their license or authorisation to manufacture, deal in or be in possession of the drugs, and it recommends that this course should be considered by the Government in each case.

"(iv) The Committee would also draw attention to the fact that, in some of the most important cases mentioned in the documents before it, it has not been possible for the Governments to take any action for the punishment of the persons engaged, for the reason that no offence against the laws of the country had been committed, and it would point out that this fact strongly emphasises the importance of the provisions in Article 29 of the Convention adopted by the Second International Opium Conference in February 1925.

"II. The Committee desires to call the attention of the Council to the large illicit traffic in opium which is being carried on between the Persian Gulf and the Far East and it suggests:

"(a) That the Persian Government should be urged to put into force *without delay* an effective system of control over exports of opium from Persian ports, more particularly by the adoption of the system of export authorisations and import certificates in respect of each consignment;

"(b) That Powers whose flag is carried by ships engaged in trade with the Persian Gulf should be recommended to adopt measures to control the conveyance of opium from the Persian Gulf on such ships and to prevent its diversion into the illicit traffic;

"(c) That Powers at whose ports vessels conveying opium from the Persian Gulf call should be recommended to put in force at once the measures contained in Chapter V of the Convention concluded by the Second International Opium Conference for the control of transshipment of consignments of opium and dangerous drugs.

"III. The Committee asks the Council to represent to the States Members of the League or Parties to the Convention the importance for the work of the Committee of the annual reports relating to the traffic in opium and dangerous drugs being despatched in no case later than October 1st following the year to which the reports relate in the case of the Far Eastern States, or than July 1st in the case of other States.

"IV. The Committee is of the opinion that it is not desirable that any scheme of propaganda for the purpose of acquainting the general public with the consequences resulting from the abuse of dangerous drugs should be prepared or recommended by the League.

"V. The Committee, having had its attention called to the extradition treaty recently concluded between the United States and Canada in respect of offenders against the laws relating to opium and dangerous drugs and being impressed with the gravity of many of the offences against those laws, suggest to the Council that the attention of the Governments Members of the League or parties to the Convention might be called to the conclusion of this treaty, and that they might be asked to examine the question, with a view to the possible conclusion of similar treaties.

"VI. The Committee, having considered the method by which the provisions in Articles 13 and 15 of the Convention adopted by the Second International Opium Conference (that a copy of any export authorisation or diversion certificate shall be sent to the Government of the importing country) can be best carried into effect, recommends that the copies should be sent direct by the authority which issues the certificate to the corresponding authority in the importing country, and that, on the Convention coming into operation, a list of the authorities in the different countries charged with the issue and reception of such certificates should be issued by the Council to all the signatory States.

"Alternatively, a copy might be sent, if preferred, through the consular or diplomatic officer in the importing country.

"VII. The Committee, having had its attention called to a statement in certain official statistics circulated by the Secretariat that an import of 'prepared opium' had been made from another country (an import which would be contrary to the provisions of the Hague Convention), considers that in such a case where there is *prima facie* reason for questioning the correctness of the statement, the Secretariat should, as a general rule, before circulating the document to other Governments, make enquiry, officially or unofficially, of the Government supplying it as to the correctness of the statement."

At its meeting in September, 1925, the Council adopted the following resolution:

"I. The Council of the League of Nations notes the technical qualifications which the Advisory Committee on Traffic in Opium and other Dangerous Drugs considers as essential for its assessors, and instructs the Secretary-General to request the Chairman of the Advisory Committee to draw up with his colleagues, and to submit in time for the December session of the Council, a list of names of persons qualified for appointment.

"II. The Council having noted the report submitted to it by the Advisory Committee on Traffic in Opium and other Dangerous Drugs on the work of its seventh session, decides:

"(1) To approve the report and resolutions of the Committee and to instruct the Secretary-General to take all necessary action arising therefrom; and,

"(2) To communicate the present report and resolutions to the Sixth Assembly."

As a result of its consideration of the reports of the Fifth Committee, the Sixth Assembly, during its session in September, 1925, passed the following resolutions and recommendations: [42]

"(a) *Work of the Advisory Committee.*

"I. The Assembly adopts the report of the Advisory Committee on Traffic in Opium and other Dangerous Drugs (Document A.28.1925.XI), together with the resolutions embodied therein.

"II. The Assembly urges on all States which have not already done so to ratify or to adhere to the agreements and resolutions adopted by the First and Second Opium Conferences.

"(b) *Appointment of a Commission of Enquiry to Visit Certain Opium-Producing Countries.*

"I. The Assembly,

"Having considered the resolution contained in the Final Act of the Second International Opium Conference with regard to the appointment of a Commission of Enquiry to visit certain opium-producing countries:

"Recommends that such a Commission should be sent to Persia to study:

"(a) The existing situation with regard to the cultivation of the poppy;

"(b) The replacement of a proportion of this cultivation by other crops.

"II. The Commission shall consist of not more than three persons to be appointed by the Council: a person having the necessary qualifications to act as Chairman, an expert on the agricultural side of the problem to be nominated after consultation with the International Institute of Agriculture, and a person having experience of business conditions and markets in the East and knowledge of transport problems.

"III. The Assembly is of opinion that such an enquiry would require for its work the sum of 100,000 gold francs and decides that this sum be voted for the purpose."

Following the desire of the Sixth Assembly the Council during its thirty-fifth session in September, 1925, adopted the following resolution:

---

[42] League of Nations. Official Journal. Special Supplement No. 32. October 1925.

"I. The Council,

"Having considered the decision of the Sixth Assembly of the League of Nations relative to the question of the appointment of a Commission of Enquiry into the opium situation in Persia, requests the Secretary-General of the League of Nations to submit at the December meeting of the Council a list of persons suitable to serve as members on the Commission of Inquiry. In preparing this list, the Secretary-General should act in accordance with the terms of Resolution 2 adopted by the Assembly with regard to the Commission on Inquiry.

"2. The Council requests the Secretary-General to approach the Persian Government with a view to ascertaining whether that government could see its way to furnishing a grant-in-aid of the Commission of Enquiry, to be sent to Persia to study the present conditions with regard to opium production."

At its session in March, 1926, the Council passed the following resolution:

"The Council decides to appoint on the Advisory Committee on Traffic in Opium and Other Dangerous Drugs as an assessor having knowledge of the commercial side of the question, M. Henri Brenier, and as an assessor having knowledge of the police side of the administration of the laws dealing with this subject, Mr. Arthur Woods, formerly police commissioner, New York City. These assessors should be appointed for the period of one year from April 1st, 1926, to April 1st, 1927.

"With regard to the appointment of the assessor having knowledge of conditions in the Far East, the Council accepts the suggestion put forward by the Chairman of the Committee that this appointment should be postponed in view of the fact that he is not in a position to make a definite recommendation at the moment, and that, in his view, no serious inconvenience would be caused to the Committee by leaving this post unfilled for the time being."

Further during the same session, the following resolution was adopted, "it being understood that account would be taken of the desire of the Austrian Government that its expert should be heard by the Opium Advisory Committee":

"The Council,

"Having examined the communication from the British Government concerning the admissibility of reservations to general Conventions and concerning the reservations to the Opium Convention (Second Conference) made by the Austrian Government,

"Requests the Committee of Experts for the Progressive Codification of International Law to report on the question of the admissibility of reservations to general conventions;

"And refers the question of the reservations to the Opium Convention (Second Conference) made by the Austrian Government to the Advisory Committee on Traffic in Opium for examination."

In June, 1926, the Council adopted the following resolution:

"The Council

"Accepts with thanks the generous offer made by the American Bureau of Social Hygiene to contribute up to an amount of 50,000 gold francs towards any expenditure incurred by the Commission of Enquiry over and above the total of the sum voted by the Sixth Assembly and the first grant made by the American Bureau.

"Authorizes the Secretary-General, under the terms of article 33, paragraph 2, of the Official Regulations, to advance, if necessary, sums not exceeding 50,000 gold francs for the further expenses of the Commission of Enquiry and to recover the amount from the additional contribution of the American Bureau of Social Hygiene."

At its eighth session held in Geneva from May 26 to June 8, 1926, the Advisory Committee made the following recommendations to the Council: [43]

I.

"The Committee, after examining the information before it relating to the illicit traffic, points out the gravity of the present situation. Considerable seizures of the manufactured drugs and of opium continue to be made, and there is no doubt that the drugs continue to be manufactured on a scale vastly in excess of the world's medical and scientific requirements. Pending the coming into operation of the Geneva Convention of February 19th, 1925, it is extremely difficult to secure an effective control of the international traffic, and the Committee desires to urge as strongly as possible that all States should complete their ratification without delay in order that the machinery of control provided for by the Convention may be brought into operation during the present year. It is, in particular, important to secure ratification by the States Members of the Council in view of the provisions of Articles 36 and 19.

II.

"The Committee recommends that the administrations called upon to decide on an application for export of drugs to a country not applying a system of import authorisations should endeavour to ascertain whether the application submitted to them is a legitimate one. This recommendation is made in the spirit which inspired Article 18 of the Geneva Convention of February 19th, 1925.

III.

"The Committee requests the Council to draw the attention of those States Members of the League of Nations and Parties to the Hague Convention which do not regularly send in annual reports on the traffic in opium and dangerous drugs, or whose reports are incomplete, to the great importance that the Advisory Committee attaches to the regular receipt of full reports, which are the only means by which the Committee can keep informed on the international traffic.

---

[43] Advisory Committee on Traffic in Opium and Other Dangerous Drugs. Report to the Council on the work of the eighth session of the committee. Geneva. May 26th to June 8th, 1926.

IV.

"The Committee recommends that the Governments, in their annual reports to the League, should be asked to state the total quantities of each of the drugs (including opium) seized by their authorities during the year, taking care to distinguish the seizures made by the Customs authorities from other seizures.

V.

"The Committee desires to draw the attention of the Council to the desirability of obtaining from all countries producing coca the statistics provided for in Article 22 of the Geneva Convention of February 19th, 1925, in so far as they relate to the export of this raw material and of crude cocaine.

"The Committee requests the Council to ask the Secretary-General to approach the Governments of those producing States which have not yet supplied these statistics with a view to obtaining this information.

VI.

"In view of the fact that Turkey has not yet adhered to the Hague Convention and that a control over the export of opium from Turkey in accordance with the provisions of the Convention is not, so far as the Committee is aware, being exercised by the Government of that country;

"In view also of the resolution of the Fourth Assembly of the League of Nations calling attention to the fact that the Government of Turkey has undertaken in the Treaty of Lausanne to adhere to the Convention:

"The Committee asks the Council to request the Government of Turkey to adhere to the Convention as soon as possible.

VII.

"The Committee has again examined the situation in regard to the export of opium from the Persian Gulf to the Far East. The bulk of the opium exported from the Gulf continues to be sent to the Far East under false declaration of destination and undoubtedly finds its way into the illicit traffic. The Committee notes that the recommendation made by it in paragraph (b) of resolution II of its Report for 1925, that Powers whose ships are engaged in traffic with the Persian Gulf should adopt measures to control the conveyance of opium from the Persian Gulf on such ships and to prevent its diversion into the illicit traffic, has not been carried out except by one of the States whose ships are engaged in the traffic with the Far East. The result has been that, while the measures taken by the latter Power have prevented the traffic from being carried on in the ships of that Power, the traffickers continue to carry it on on the ships of other countries. It accordingly asks the Council to make urgent representations to the Governments of the countries whose ships were engaged in the traffic during the past year to take the necessary measures for the control of the traffic. Further, the Committee recommends that the Governments of Powers having extra-territorial rights in Persia should be asked to institute a control over their nationals in Persia on the lines of the regulations already made by some Powers in order to prevent their engaging in the illicit traffic in opium.

VIII.

"The Committee desires to call special attention to the steps taken in Great Britain in regard to maritime insurance with a view to preventing the insurance of consignments of opium or drugs destined for illicit purposes, and would urge that similar steps should be taken as soon as possible in other countries whose nationals undertake the business of maritime insurance.

IX.

"The Committee draws special attention to the evidence it has received of the extensive use of the post by illicit traffickers in morphine and the other drugs with the Far East. As this is a danger to which all countries are exposed, the Committee recommends:

"(a) That the Council should bring the matter to the notice of all Governments and of the Universal Postal Union;

"(b) That notice of any seizure of drugs sent from abroad through the post should be sent immediately, with particulars of the place at which and the date on which the drugs were posted, to the authorities of the country from which the drugs were sent;

"(c) That a list of all such seizures and of the results of the investigations made should be included in the annual reports of the Governments to the League.

X.

"The Advisory Committee asks the Council to draw the attention of the Governments to the importance of direct communication between the authorities which are entrusted with the enforcement of the laws on the suppression of the illicit traffic. The Committee has already several times laid stress on this point, and the matter is dealt with in Article 3 of the Final Act of the Second Opium Conference.

"Communications of this kind might be established either by exchange between these authorities of information on administrative or police measures or by direct contact between the said authorities.

XI.

"The Advisory Committee requests the Council to instruct the Secretary-General to ask those States which have not yet communicated their legislation on opium and drugs to do so and to give notice of any new laws which may be promulgated."

The Fifth Committee of the Seventh Assembly, September, 1926, reported at follows: [44]

---

[44] Report of the Fifth Committee to the Assembly. Geneva. September 17, 1926.

"The Eighth Session of the Advisory Committee on Traffic in Opium and other Dangerous Drugs met from May 26th to June 8th, 1926. The report on the work of the Committee at this session (see document A.20. 1926.XI) was examined by the Council during its meeting on September 2nd. The Council took note of the report and instructed the Secretary-General to take the action arising out of the resolutions contained therein.

"The enormous extent of the illicit traffic in opium and drugs continues to be the most serious difficulty confronting the Advisory Committee. Various members of the Fifth Committee underlined this fact and laid stress on the necessity for international action against this worldwide traffic. The Advisory Committee has expressed the opinion that an effective control of the international traffic will be extremely difficult until the Geneva Convention of February 19th, 1925, comes into operation. The Fifth Committee agrees with the Advisory Committee as to the importance of early ratification of this Convention and, on the proposal of the British representative, decided to recommend to the Assembly the adoption of a resolution on the subject (see resolution 2).

"The Fifth Committee also agrees with the Advisory Committee as to the importance of the furnishing by Governments of annual reports and other information regularly and without delay. It should not be forgotten that the Governments which have ratified the Hague Convention are under a formal obligation to furnish such information (Article 21).

"The Fifth Committee takes note of the opinion expressed by the Advisory Committee to the effect that the ratification of the Hague Convention by Turkey would mark an important progress.

"The delegate of Persia informed the Committee that the question of the ratification of the Hague Convention by his country would be examined when the Commission of Enquiry into the opium situation in Persia had issued its report.

"The Fifth Committee again calls attention to the increase in the illicit traffic from the Persian Gulf and expresses the hope that the various Governments concerned will take steps to remedy the situation in accordance with the recommendations of the Advisory Committee. It also calls attention to the importance of direct communication between the authorities entrusted with the enforcement of the laws with regard to the suppression of the illicit traffic.

"A suggestion was made by the representative of Greece that, when a subject of special importance to a particular country not represented on the Advisory Committee is to be considered by that Committee, the Committee should invite that country to send a representative to attend the discussion. The Fifth Committee thinks this suggestion should be communicated to the Advisory Committee, which will no doubt wish to give effect to it so far as it is practicable to do so.

"The Fifth Committee appreciates the efforts made by the Government of India towards diminishing the consumption of opium and dangerous drugs and the export of opium, and in particular the decision to extinguish totally the export of opium for other than medical and scientific purposes within a period of ten years.

"The Fifth Committee heard with great interest a statement made by the delegate for the Kingdom of the Serbs, Croats and Slovenes to the effect that his country was in a position to satisfy the legitimate needs of opium in Europe, and that, in his opinion, it would therefore be possible eventually to cease imports from the East altogether. The production of the Kingdom amounts to about 150,000 kilos a year and effective control would be very easy to institute.

"The Fifth Committee unanimously adopted the report of the Advisory Committee on Traffic in Opium, together with the resolutions contained therein. The delegate of Italy abstained from voting. The delegate of the Netherlands did not oppose the adoption of the report, but he made a reservation on behalf of his Government concerning the second resolution contained in the report of the Advisory Committee.[45]

"The delegate of Italy made the following statement:

> " 'The Italian delegation, in view of the gravity of the situation exhibited by the report presented to the Committee, considers it necessary for the improvement of the situation to adopt the following measures:
>
> " '(1). That the Advisory Committee be composed in equitable proportions of persons acquainted with the problems of narcotics and belonging to producing and manufacturing countries on the one hand and consuming countries on the other;
>
> " '(2). That the Advisory Committee thus composed should proceed to take effective measures for a strict application of the Hague Convention;
>
> " '(3). That the Secretariat of the League of Nations should be placed in a position to carry out the duties assigned to it by the Covenant and the resolution of December 15th, 1920.'

"The Fifth Committee proposes to the Assembly the adoption of the following resolutions:

> " '1. The Assembly adopts the report of the Advisory Committee on Traffic in Opium and other Dangerous Drugs, together with the resolutions contained therein.
>
> " '2. The Assembly, impressed by the report of the Advisory Committee as to the gravity of the present situation in regard to the illicit traffic and by the resolution of the Committee that it was extremely difficult to secure an effective control of the international traffic in opium and drugs until the Geneva Convention has been brought into operation, urges on the Governments of all States Members of the League to proceed to ratify or adhere to the Geneva Convention so that, if possible, the ratifications necessary to

---

[45] This resolution reads as follows:

> " 'The Committee recommends that the administrations called upon to decide on an application for export of drugs to a country not applying a system of import authorisations should endeavor to ascertain whether the application submitted to them is a legitimate one. This recommendation is made in the spirit which inspired Article 18 of the Geneva Convention of February 19th, 1925.' "

> bring that Convention into force may be deposited with the Secretariat before the end of the year.' "

The recommendations of the Fifth Committee were adopted by the Assembly on September 21, 1926.

In December, 1926, the Council passed the following resolution:

> "The Council instructs the Secretary-General to invite the Italian Government to nominate a representative to sit as a member on the Advisory Committee on Traffic in Opium and Other Dangerous Drugs."

Pursuant to the recommendation of the Sixth Assembly and the action of the Council in December, 1925, the Commission of Enquiry into the Production of Opium in Persia, composed of Mr. Frederic A. Delano (United States of America), a former member of the Federal Reserve Board, Chairman; Dr. Fridiano Cavara (Italy), Professor of Botany at the University of Naples, and M. Victor Cayla (France), Agricultural Engineer, visited Persia in accordance with its instructions. The conclusions and recommendations of this Commission are given below: [46]

> "From the study of the evidence submitted to it and the personal investigations it has conducted, the Commission, in response to the specific lines of enquiry it was required to make, begs leave to report:
>
> "1. That it has diligently and carefully studied *the existing situation with regard to the cultivation of the poppy in Persia,* and that it has endeavored, in the report now submitted, fully to present and explain that situation.
>
> "2. That it has investigated as carefully as possible *the question of the replacement of a portion of this cultivation by other crops,* and in doing so has presented in the report now submitted what it believes may successfully be accomplished, given adequate time: (a) by the substitution of 'other crops'; (b) by better methods of cultivation, which will result in greater yields from existing crops; and (c) by the creation of industries which will make the cultivation of new crops possible.
>
> "Finally, it has arrived at the conclusion that, while difficult of accomplishment, it is possible and practically feasible, and to the economic interest of Persia, to adopt a programme for the gradual diminution of the cultivation of the opium poppy, and, in this connection, is glad to call attention to the formal letter of the Persian Government addressed to the President of the Commission under date of Teheran, June 1st, 1926, in which it is stated categorically

---

[46] Commission of Enquiry into the Production of Opium in Persia. Report to the Council. Geneva. 1926. A. 7. 1927. XI. C. 580. M. 219. 1926. XI.

that the Persian Government has the intention of gradually reducing the production of opium to medical needs.[47]

* * * *

"Having arrived at the above conclusions, the Commission begs leave to submit in review its various findings in the form of a summary of what has been stated more fully in the body of the report.

"In view of the explanations made by the Persian Government, we must consider in order the various suggestions it has made and the obstacles which, in its opinion, exist. These are, first, budgetary; second, export importance and trade balance; and, third, cash yield of crop to the producer.

"*Budget.*—In round figures, the national income from taxes and charges against opium amount to 2,000,000 tomans per year, which is estimated at about 20 per cent of the gross value of the crop and apprixmately 8 per cent of the total revenue to the State, against which must be charged cost of control, cost of alimentation and other less definite items. When all the factors are taken into account, the Commission believes that, viewed from the standpoint of its budget, the Government can safely undertake a reasonable programme of progressive curtailment.

"*Balance of trade.*—The trade balance has been considered by the Commission both from the commercial and the economic viewpoint, calling attention particularly to the recent great increase in the export of mineral oil and the method adopted by the State in dealing with this subject. The point is also made that in the last fifty years there has been an almost steady increase in the importation of manufactured articles and a diminution of production of manufactures for home consumption. The effect until recent years has been to create an unfavourable trade balance during a large portion of this period, reflected in national debt and impoverishment. The Commission believes that even if we accept the Government's method of treating the subject of oil exports, a programme of substitution, based on a development of agricultural methods, will enable the country to secure from food crops, from textiles, from sugar, and from correlative industries more than enough to balance losses in exports. As fully explained, this is a matter of time.

"*Cash crop.*—The investigations of the Commission indicate that the cash yield per unit from the production of poppy to the cultivator is about four times the yield from the growing of wheat. Against this apparent advantage in the case of poppy there must be considered the various items of direct and indirect cost. The Commission is convinced that with better agricultural methods the production of various crops could be increased sufficiently on the same area of ground fully to equal the loss due from restricting the production of the poppy. Of course, nobody proposes that the suppression of the poppy crop will be effected except on some gradual and perfectly practical plan.

---

[47] "It is our conviction that the production of opium can be curtailed. . . . Nevertheless, the Persian Government will take immediate measures to reduce the production of opium to medicinal requirements and will prosecute these measures as rapidly as circumstances permit. The Government is likewise determined to put a stop to the smoking of opium within the country as rapidly as possible. (Extract from letter from Persian Prime Minister to President of the Commission dated June 1st, 1926.)"

"*Transport.*—The great importance of transport and means of communication in the development of Persian agriculture and other industries and in opening up marketing possibilities, not to mention its importance from a military and political standpoint, is fully exposed.

"We now come to other but allied considerations: namely, the effect which these proposals may have upon the peasant, the landowner and the merchant.

"*Peasant.*—The findings of the Commission indicate that the peasant is deserving of more than ordinary consideration on account of his general character and capacity for development; that the growing of the poppy is closely associated with a work system which is degrading and that in districts where more emphasis is put upon food crops the peasants are in better condition and are decidedly more prosperous.

"*Landowners.*—The landowners, especially the larger landowners and those who are themselves opium merchants or associated with opium merchants, fare pretty well in the cultivation of the poppy, and yet it is strongly indicated that the cultivation and sale of the crop is attended with considerable hazard and not as uniformly profitable as generally supposed. While the immediate effect of limiting the poppy culture might be detrimental to the proprietor, it is the belief of the Commission that more intensive agricultural methods will, because they will benefit the country, benefit the landowners.

"*Merchants.*—The opium merchants, and particularly the larger merchants, appear to the Commission to be those whose interests are most strongly opposed to any change of the present cultivation. They may be assumed to be solidly against it.

"*General economic effects of substitution.*—The effects of substitution on the general economics of Persia have been fully discussed under the following headings:

"(a) *Substitute Crops: Food and Other Crops.*

"Persia has need in her own domestic economy for more of these crops than are now produced. The Commission believes that their cultivation should be increased and that economy will result from more intensive cultivation without increased acreage.

"(b) *Industries.*

"The Commission has pointed out a number of industries closely associated with various products of the land and the soil, the existence and encouragement of which should increase the national wealth. These are: the textile industry (silk, cotton and wool), the carpet industry, sugar (especially cane sugar), the dried and preserved fruits industry, the lime and cement industry and the clay products industry. Several of these industries have suffered in the past for want of a cheap fuel. The great expansion of the oil industry has opened the possibility of fuel oil as a most important item in this development.

"*Preparation of a programme.*—The Commission considers that, instead of attempting to reduce the cultivation of the poppy immediately, the Persian Government should make it an essential part of its programme to take definite steps looking to and preparatory for a gradual and systematic reduction, to begin three years from the promulgation of that programme. Among the most difficult of the questions involved are, naturally, those connected with the control of poppy cultivation.

"The Commission has envisaged in its report certain suggestions for registration and licensing of acreage devoted to the growing of poppy.

"The registration and licensing of, and the requirement of a surety bond from, all merchants authorised to buy and sell opium are also indicated.

"The Commission suggests that the Persian Government should consider the advisability of revising its export and excise taxes on opium with a view to reducing the wide disparity and yet securing a larger total yield.

"Lastly, the adoption of identifying marks on all opium produced and sold is also proposed.

"Recognising the difficulty due to the widely scattered nature of the cultivation and the difference of conditions that exist, the Commission believes it may also be necessary to allow one year, or perhaps even two, for carrying out experiments in different sections of the country in order to determine how the programme of retrenchment of acreage shall be made effective. On the face of it, it is evident that substitution can more readily be made in certain regions than in others. Where better facilities of transport exist, or in the neighbourhood of large towns, things can be done which cannot be done in less-favoured regions.

"*General programme of reduction.*—At the end of this preparatory period of three years it is proposed to proceed with the following general programme:

> "(a) Continue the road programme on as big a scale as budgetary expenditure will permit, including in this programme the initial development of a railway system;
>
> "(b) Allot to the most promising irrigation project enough to undertake it and complete it in one, two or three years;
>
> "(c) Develop the farm demonstration work heretofore undertaken, emphasising the practical rather than the theoretical side;
>
> "(d) Adopt a system of tariffs, which shall encourage those home industries which Persia can undertake most successfully and which, by reducing imports, will help the balance of trade;
>
> "(e) Simultaneously with the announcement of these internal undertakings, the Government shall formulate a programme for the gradual reduction of the acreage allocated to the opium poppy. With all the land so devoted properly registered, a systematic reduction can be undertaken, which can be so handled as to make the reduction first in those localities where substitute crops or industries are most possible.

"The Commission believes that, beginning with the fourth year, the Persian Government might safely undertake a reduction of 10 per cent per year in the acreage allotted, and each year thereafter a further reduction of 10 per cent of what remains. This method of reduction will operate more rapidly at the start and more gradually thereafter, as follows:

	Beginning of						
	4th year	5th year	6th year	7th year	8th year	9th year	10th year
Percentage at beginning	100	90	81	72.9	65.6	59	53.1
Reduction	10	9	8.1	7.3	6.6	5.9	5.3
	90	81	72.9	65.6	59.0	53.1	47.8

"As this method of reduction becomes more and more gradual, the acreage at the end of the fifteenth year is reduced to 28.2 per cent and in the twentieth year to 16.7 per cent. Before that time, Persia will have determined her policy of substituting othr crops and industries.

"The Commission fully appreciates the importance of not curtailing a crop yielding approximately 8 per cent of Persia's tax revenues and 16 per cent in value of her gross exports without suggesting as a proposal measures which will effectively offset the curtailments proposed.

"During the first three years—*the years of preparation*—the Commission believes that the revenues from the various opium taxes and from a more effective control of tax collection can be increased not less than 1,000,000 tomans per year.

"It is assumed that, as the means of communication are improved and progress is made in encouraging the production of more and better cotton and the introduction of cotton-spinning and weaving machinery, there will be a corresponding reduction in the import of cotton piece-goods. While progress should be made in this direction, it is assumed that only the foundation work can be accomplished in the first three years. This programme of building up the cotton textile industry in Persia must necessarily include the placing of a protective tariff on cotton yarns and piece-goods.

"Similar plans, in so far as practical, will be employed in an effort to develop the wool and silk industries.

"Special study and consideration must be given also to sugar-beet and sugar-cane, with a view to their development and the fabrication of raw sugar. While it will take all of the three years of preparation to make a substantial progress in carrying out these suggestions, it is believed that by the fourth year the production of home-grown sugar will begin to have an effect in balancing foreign trade, because sugar is now the second most important subject of import.

"There are certain other taxes on imports which may be raised to advantage, especially where a tariff for revenue may also aid in the establishment or the re-establishment of a home industry.

"It is assumed that, for a period of five years, there will be no diminution in the receipts from the various taxes and license fees on opium and that in the first three years of this period there will be the substantial increase of 1,000,000 tomans per year. A further sum of 1,000,000 tomans per year should be realisable from other sources.

"These increases in receipts it is proposed to apply to carrying out the programme suggested by the Commission.

"It is not possible to predict accurately receipts and expenses for several years in advance, and the above suggestions are therefore simply illustrative.

"Presumably, as the means of communication improve, the necessity for the present relatively high expenditure upon the army and gendarmerie can be safely diminished and the money so saved used for productive expenditure and internal improvements. The same may also be said of the very large expenditure now devoted almost yearly to the Alimentation Service.

"The Commission fully realises that the execution of so large an undertaking as here discussed necessarily involves questions of internal administration, which only the Persian Government can determine. For the foregoing reason, and for the further fact that the terms of its mandate clearly indicate that this phase of the subject is beyond its scope, these questions are not discussed."

On March 4, 1927, the Persian Delegate, M. G. Kemal Hedayat, submitted to the Secretary-General of the Council the observations of the Persian Government on the report of the Commission of Enquiry as follows: [48]

"Geneva, March 4th, 1927.

"The Secretary-General:

"I have the honor to present hereunder the observations of the Persian Government on the 'Report of the League of Nations Commission of Enquiry into the Production of Opium in Persia' and the proposals of the Government relative to the curtailment of opium production.

"The Persian Government has examined with the greatest care and attention the report of the League of Nations Commission of Enquiry into the Production of Opium in Persia, and desires to express to the Council of the League of Nations, and through it to the eminent members of the Commission, its deep appreciation of the open and fair-minded attitude with which they approached their difficult task and of the ability and energy brought to its accomplishment.

"Realising the very short time that was at the disposal of the Commission for its investigation in Persia, and appreciating their sincere effort to obtain and present the essential facts, the Persian Government is not disposed to consider the report in any spirit other than that of sympathy and co-operation. The exceptions taken have been treated in detail in the appended 'Observations' on the Report, not in any spirit of criticism or obstruction but with a view to the vital importance of the opium problem to the economic life of Persia and to the duty that devolves upon the Government, with respect to its international as well as its national obligations, to ensure that there shall be a full and clear presentation of the actual facts of the situation.

---

[48] Commission of Enquiry into the Production of Opium in Persia. Geneva Mar. 28, 1927. A. 8. 1927. XI.

"General Considerations.

"Narcotic Control.

"In narcotic control the chief aim, it would seem, is the elimination of the illicit trade in habit-forming drugs. It is therefore necessary to call attention to the insignificant part taken by Persian opium in this traffic. The statistics compiled by the Opium Section of the League of Nations indicate that, if the entire opium production of Persia were suppressed, the effect on drug manufacture would be practically negligible, since the opium used in the manufacture of narcotic drugs is furnished almost entirely by other countries.

"Plan for Reduction.

"The plan for reduction proposed by the Commission does not appear to take into consideration the legitimate demands for opium, and no suggestion appears to have been made by the Commission with reference to the relation that the proposed reduction in Persian cultivation should bear to the reduction in other opium-producing countries, all of which have better transportation facilities, better water supply, and better access to markets for their products. If the hoped-for reduction in the manufacture of narcotic drugs and in the production of their raw material is to be attained, it would appear desirable that the reduction considered necessary should be made effective about the same time in all the producing and manufacturing countries.

"If, however, there is to be a curtailment in opium production, a start must be made, and the Persian Government proposes to submit a programme of reduction to the Majliss without attending the prior acceptance of a similar programme on the part of other producing or manufacturing countries.

"Time and Cost of Substitution.

"The Commission has envisaged the problem of substitution in its general rather than its particular aspects. For an eventual solution this is undoubtedly correct, but the opium question is one that is pressing, not only for Persia, but for the whole world. It is obvious that, given time and good will, the production of the raw material of narcotic drugs and their manufacture can be reduced everywhere to medicinal requirements. But with the rapid increase in drug addiction, time does not permit of solutions depending on the general acceptance of a moral conception and upon gradual improvements in economic conditions for their realisation. Solutions which will give prompt results are necessary, and for such solutions not general but specific measures must be proposed. Specific measures require specific supporting data as to time and cost.

"It will therefore be obvious that the time required and the cost of substitution are questions of first importance. The Commission has not found it possible to submit definite estimates as to these factors. It is, however, clear that, for each of the important crop substitutes, several years' preparatory work will be necessary to enable seed selection, demonstration and improvement in quality and for the organisation of the trade. A period of years will also be required for the provision of the additional water required, and for the road and railroad construction which is necessary.

"*Finance.*

"For the financing of the suggested programme of reduction, the Commission suggests that one million tomans[49] per annum be realised from increased opium revenues and one million tomans from other sources. The increase in opium revenues cannot be looked upon as a certainty. There may be a loss if the acreage tax is put into effect, even if, as proposed, the export duties are increased. The Commission does not indicate the revenue sources from which the second million tomans is to be derived. Even if the Government succeeds in obtaining the desired revenue increases, it must be borne in mind that, in addition to the expenses incident to opium curtailment, there are other important and pressing demands upon the country's budget which cannot be immediately postponed.

"*Action proposed by the Government.*

"In view of the evident difficulty of estimating precisely in advance either the cost or the time required for the introduction of substitute crops, the provision of the necessary water and transport facilities, and the creation of new industries, it would not be possible at this time for the Government to ask the Parliament to approve an unconditional programme of reduction. The three years' preparatory interval suggested by the Commission seems to be very short in comparison with the magnitude of the task to be undertaken. The Government, however, accepts to include it in the programme to be submitted to the Majliss and hopes that it will prove adequate for the enactment of the requisite legislation and for the initiation of the constructive measures necessary to enable the realisation of the programme of opium substitution recommended by the Commission.

"In view of the necessity for a successful outcome to the proposed practical test of production curtailment, we are confident that Persia will not be expected to undertake a programme which would in practice be ineffective or which would unnecessarily discriminate against the economic interests of the country. If the economic condition and likewise the geographic and commercial situation of Persia are taken into consideration, it will be agreed that, in reducing the cultivation of opium, Persia should enjoy a lower rate of curtailment and a larger share of production than other countries for which, from other standpoints, the means of economic progress are more available than for Persia.

"Neither is it to be expected that the Persian Government and people will continue to support a programme of reduction unless Persia is accorded substantial equality of opportunity with regard to the world's trade in medicinal opium and unless Persia is enabled to put into effect the reasonable measures which are essential for fiscal and economic readjustments. Among these reasonable measures, the Commission of Enquiry has particularly noted and recommended tariff autonomy. The Persian Government is likewise convinced that the independence and freedom of the Persian Government regarding the establishment of legal Customs tariffs are essential for the protection and encouragement of Persian substitute industries and the promotion of exports. In fact, the attainment of this aim is the *absolutely necessary condition* of success of the Persian Government in pursuance of the policy which the League of Nations is considering for curtailment of the production of and commerce in opium. The Government is confident that there will be a generous appreciation by other Governments of this important aspect of the situation. It will, no doubt, be also taken in view that it is possible for other Governments to lend assistance by reasonable reduction of import duties and other charges and burdens which hamper Persian exports.

---

[49] One toman or ten krans may be considered as approximately $1 U. S. A.

"Parliamentary Approval.

"It will be appreciated that any restriction of opium cultivation or export will require Parliamentary approval and that, under the Persian constitution, no international agreement can be entered into by the Persian Government except after formal ratification by the Majliss.

"In view of the foregoing considerations and after a careful study of all aspects of the situation, the Government has prepared the following programme which it will submit to the Majliss, with recommendation for its enactment into law.

"Programme for Opium Legislation.

"1. Approval of recommendation of reduction in area under poppy cultivation of 10 per cent per annum after three years on the plan proposed by the Commission of Enquiry.

> "Note.—The annual reduction to continue for three years, after which time the Persian Government will reconsider its position, taking into account the effect the reduction has had on the welfare of the cultivator, the trade balance, the budget, and the general economic condition of the country, and what action has been taken by other producing and manufacturing countries to curtail the production of the raw material and the manufacture and distribution of habit-forming drugs.

"2. Acceptance of the opium import certificate system with an annual reduction, beginning not later than the third year after the present, of 10 per cent of the quantity annually permitted to leave the country without production of opium import certificates.

> "Note.—Subject to the reservations indicated in the note to paragraph 1.

"3. An exemption from land taxes for a period of five years in the case of areas diverted from the cultivation of the poppy to that of substitute crops.

"4. Preference in the granting of agricultural loans to be given by the State Bank of Persia, when established, to cultivators who divert part or all of their land under opium cultivation to that of substitute crops.

"5. In agreement with the intention of the League of Nations and the recommendation made by the Commission, the Government promises to study the increase of export Customs duties on such opium as is exported without certificate, and likewise to study changing the existing taxes on opium to other taxes which will facilitate and expedite the decrease of the cultivation of and commerce in opium."

In further consideration of the subject-matter covered in the two preceding documents, Mr. Frederic A. Delano, Chairman of the Commission on Enquiry, addressed the Secretary-General as follows: [50]

"Washington, D. C., April 23rd, 1927.

"To the Secretary-General:

"Your letter of March 29th in regard to the proposed action to be taken with the Report of the Commission of Enquiry into the Production of Opium in Persia is at hand. May I assume that you will permit me, in view of the recent observations offered by the representative of the Persian Government, to submit certain personal comments, even though it has not been possible for me to consult my colleagues since the receipt of the data?

"For a clearer understanding of the subject-matter of the report, a brief review of its salient features, both as to its basic facts and its findings, will be helpful. This is especially true because the report of the Commission was necessarily a composite product of three men of widely different experience, each one approaching the problem from his own point of view; and while the report as submitted was the unanimous report of the Commission, it is perhaps less clear and less readily understood than if it had been made by any one of the three Commissioners in his own way. Notwithstanding these difficulties, which are inherent to almost any report of this nature, the Chairman submits the following as his personal expression of the salient features of the report and the conclusions arrived at:

"THE FINDINGS.

"(Based, as explained by the Commission, largely on its own observations and those of previous European investigators, rather than upon statistical data which were largely non-existent.)

"1. Persia was once the centre of the then-known civilised world, and the chief trade routes to the Far East lay across it. To-day it is off the main trade routes and, at least relatively speaking, is far more inaccessible than formerly.

"2. North and North-west Persia have, under normal conditions, easy and close trade relations with Russia, Iraq (Mesopotamia), and with Turkey; while North-east Persia has close trade relations with Russian Transcaucasia, Russian Turkestan and Afghanistan; and South Persia close trade relations with Great Britain, with Iraq and with India.

"3. Owing to the lack of good means of communications either by land or sea, internal commerce is greatly restricted, and foreign commerce exists, broadly speaking, only with cities near the frontier. (The report shows that the transport charges on goods moved chiefly by caravan, reduced to our nomenclature, amount to from 18 to 35 cents per ton mile.)

---

[50] Commission of Enquiry into the Production of Opium in Persia. Geneva June 1, 1927. A. 16. 1927. XI.

"4. While it is probably true that Persia's undeveloped and undiscovered resources are large, the Persian people as a whole are poor—very poor; and this is due to economic conditions which have in the last hundred years been driving her to the wall. During a considerable part of this time, Persia's trade balance has been against her, and the deficit has been in part represented by debt, but more often in the depletion of her capital, in her case of those savings of the past in the form of rare art treasures, beautiful fabrics, tiles, miniatures, and the like, which, to a constantly increasing extent, have gone out of Persia and have found their way into the collections of Europe and America.

"5. By reason of famine, disease, civil wars, the causes of which may be traced largely to bad economic conditions, the population of the country has greatly diminished in the last fifty or sixty years, and is to-day, let us say, not in excess of one-third or one-fourth of what the country under more ideal economic conditions might support.

"6. Persia, being a country of very scanty rainfall (estimated at from two to twelve inches per year), except in the north-western region and the Caspian Littoral:

> "(a) The cities and towns are located at the foothills where water from the melting snow is available;
>
> "(b) Broadly speaking, one-third of the country is a desert, another one-third is mountainous and chiefly suitable for grazing;
>
> "(c) The cities are far apart, and as the means of communication are poor, each city is a small empire by itself, only feebly connected with the capital;
>
> "(d) Agriculture is chiefly dependent on irrigation, which demands intelligent and industrious labour, but that does not permit Persia to compete in the production of raw materials with those countries having an abundant rainfall. In addition, Persia is at a disadvantage of distance and high transport costs in reaching world markets.

"7. The Caspian Littoral and the Karun Valley, lying adjacent to the Mesopotamian Plain, are to a considerable extent an exception to the above comments.

"8. There is a lack of security in Persia which accounts to a considerable extent for what is frequently termed by foreigners a lack of initiative or public spirit. For example, the Commission found no disposition to store grains (e.g., in ground silos) in abundant years to carry over to lean years. The reason given was lack of confidence in the security, the high rates of money, the want of adequate protection of private property.

"9. Land titles in the same way are indefinite and insecure. There is no such thing as a land survey, or as the registration of titles. Something approaching it exists through the Church authorities.

"10. Opium poppy is an ideal crop from several points of view, but chiefly because:

"(a) It is an autumn-sown crop which can be irrigated in the late fall and early spring when water is plentiful. It is harvested in the late spring or early summer;

"(b) It has a high value per pound and money yield per acre, say, four times that of wheat and barley, which are also fall-sown crops;

"(c) Its high value per pound (say, $6 to $8) is such that it can bear the terrifically high transport charges prevalent in that country;

"(d) Being largely exported, it helps Persia to pay for imports, but it is not by any means certain that Persia would not be better off if she did not buy so largely abroad.

"11. A number of industries for which Persia was once famous are dying out and Persia, instead of exporting only manufactured goods having high value (and so able to bear a high transport charge), is attempting to export raw material, such, for example, as wool, cotton (of inferior grade), rice, etc.

"12. The industries which are dying out and which might be restored, are the production of:

"(a) Silk, wool and cotton fabrics;
"(b) Pottery, tiles, earthernware, bricks;
"(c) Artistic metal-work;
"(d) Woodcarving, inlaying, etc.;
"(e) Painting miniatures, decorating, engrossing parchment, etc.;
"(f) Sheep, lamb and goat skins, hides, leather goods.

"13. In addition to the industries which are dying out and which may again be put upon their feet, certain other industries can be developed, for example:

"(a) Those dependent on the development of mineral oil, of which there is very evidently an abundance;

"(b) Vegetable oils from oil seed, such as rape seed, peanut oil, castor oil, soya beans, etc.;

"(c) Making and distributing dried fruits, preserves, etc.;

"(d) Making sugar, especially from sugar cane;

"(e) Plaster of paris (gypsum), lime and cement.

"14. The Commission noted that the methods of agriculture were very primitive, but remarked that it does not follow therefrom that the farm implements and tools of Western Europe and America can be applied to Persian conditions, which are very different from those of Europe. The Commission fully appreciated the great difficulties in the way of introducing new methods of cultivation and crops.

"CONCLUSIONS OF THE COMMISSION.

"It is apparent from the above facts:

"1. That Persia is suffering seriously from wretchedly inadequate means of internal communication; that this puts a very heavy tax upon commerce within the country itself. It is often far cheaper for a city close to the frontier to purchase from foreign countries raw materials or manufactured products which are produced or might be produced in Persia. The need of improved means of communication, chiefly roads for wheeled vehicles, is clearly indicated, though there is also an argument, supported not solely on economic grounds, but also by strong political and military reasons, for building a railroad from the capital to a port on the Persian Gulf.

"2. Improved agricultural methods, adapted to intensive agriculture and horticulture, because the country is so dependent on irrigation, were urged by the Commission. Without increasing the acreage under cultivation, or the water consumed in irrigation, a greater product, or a product of greater value per acre, was believed to be possible.

"3. A careful study of the water resources with a view not only of conserving the water supply, but of securing it more efficiently and economically, was suggested. The use of artesian wells, oil pumps, and windmills, was suggested as promising.

"4. The need of cheap combustibles is great on account of the bearing that it will have on various industries, some of them ancient industries which are dying out; also because a cheap combustible such as fuel oil or coal would stay the destruction of the forests and enable the gradual reforestation of the country, which is now sadly denuded. This has had an important effect in the destruction of soil through erosion, as well as by its indirect effect on climate.

"5. A revival of the dying industries, and the protection of Persia against economic pressure of countries already highly industrialised, can only be brought about by a protective tariff. It may or may not be desirable for Persia to adopt the industrial methods of Western Europe and America (and on this point the Commission does not express an opinion), but whether or not it is desirable, the country needs protection during the period of adjustment which, even under favourable conditions, would take a considerable number of years to bring about.

"6. The production of opium exists largely by reason of the economic conditions aforesaid. The Persian Government has indicated by its own actions, and by its efforts to prevent the consumption of opium at home (it is absolutely forbidden in the Government service or in the Army), that it considers the use of opium a serious menace. The Commission came to the conclusion that it was even a more serious menace than was usually appreciated; that it was slowly but surely destroying the man-power of the country; that it was impossible to produce opium for export and not have it also consumed in considerable quantities at home.

"RECOMMENDATIONS OF THE COMMISSION.

"In view of the basic facts and of the conclusions derived therefrom, the Commission recommended the following programme:

"1. That Persia should allow three years to put its house in order, by which was meant improving its internal economic condition, making a start on building its roads, adjusting its tariffs of import duties, improving its agricultural methods, building up its sources of revenue, before it undertook a reduction in the production of opium and the substitution of crops and industries therefor.

"2. That better and more complete methods (indicated in considerable detail) be employed for the control of opium production and distribution.

"3. Having taken these preliminary steps, it was believed that the Persian Government could safely undertake to reduce opium production by a reduction of ten per cent annually.

"GENERAL COMMENTS.

"It is important to appreciate that the Commission realised, in undertaking its mission, that its work would be futile if its recommendations did not appeal to the Persian Government and to leaders of thought in Persia as reasonable and practicable. The Commission was industrious in its efforts at working out such a solution of the problem as it believed the Persian Government might fairly be asked to undertake. The Chairman, speaking always in his individual capacity, sees nothing in the observations of the Persian representative to cause him to change his views. Doubtless the Commission has fallen into some errors of fact or conclusion, but it appears that these errors are not sufficiently important to modify the fundamental recommendations; and the Persian representative graciously accepts the programme as a *modus vivendi* for the coming six years, suggesting that the progress thereafter shall depend on the acts of other producing nations.

"The Commission arrived at the conclusion that the production and use of opium in Persia had an important effect in sapping the vitality of the race. Furthermore, recent development in chemical research indicates that there is a serious economic risk attendant on the production of opium from poppy because the day is certainly not far distant when it will be produced synthetically and at a cost far less than it can be produced from the poppy. When that time comes, the production of the opium poppy will exist solely for local consumption, or for export for eating and smoking. Whether the result of this will be to make more difficult or less difficult the control of narcotics is another problem which need not be considered here; but it seems reasonably certain that when the alkaloid morphine can be produced in large quantities synthetically, it will be far less profitable to produce the opium poppy. This feature of the subject was not considered by the Commission, and is mentioned here only because of recent information coming to the writer; but any well-wisher of Persia must be convinced that the best thing she can do for her own welfare is to plan for a gradual replacement of poppy culture by agriculture products, and the development of industries, even though they do not immediately yield the same cash return. Such a course is the only one that will in the long run put the country on its feet.

"In the observations of the representative of the Persian Government, most of which happily support the conclusions of the Commission, two criticisms are made which deserve especial notice.

"The first of these is a statement that the Persian opium is low in morphine content and therefore unsuitable for the making of morphine and only suitable for smoking or eating. This may be true, but if true it is contrary to the claims repeatedly made to us by Persian officials. The Commission gave, on page 39 of the text of the report and in the footnote, the basis of its statement and there seems to be no reason as yet for modifying that statement.

"Secondly, the Commission is criticised for not taking into account the relations which the reduction of poppy cultivation should bear to the reduction of its production elsewhere. This was not an oversight by the Commission, for the point was made more than once by Persian officials who appeared before the Commission. As pointed out by the Commission, then, such a suggestion would have been entirely beyond its authority.

"In closing this communication, permit me to say, my dear Mr. Secretary-General, that the observations of the Persian representative appear, on the whole, to support the report of your Commission in all essential particulars, and I therefore feel sure that my distinguished colleagues will join me in hearty thanks and appreciation for the courteous and appreciative reception of the Commission's efforts to serve not only the League of Nations but the Government of Persia."

The work of the Advisory Committee during its Ninth Session is covered in the following report: [51]

"I.

"The Committee desires to call the special attention of the Council to the long delay in bringing the Geneva Convention of February 1925 into force. Notwithstanding the resolutions adopted by the Council and the Assembly during the years 1925 and 1926 on the subject, the number of ratifications deposited up to the present date, nearly two years after the close of the Conference, is very small. The Committee would, in particular, respectfully remind the Council that, under Article 36 of the Convention, the Convention will not in existing circumstances come into operation until at least seven of the States represented on the Council, of which two must be States having permanent seats, have ratified it, and that up to the present only one permanent Member and one non-permanent Member of the Council have done so.

"The Committee would urge in the strongest way that great difficulties will continue to be encountered in dealing with the huge illicit traffic which still exists unless the further powers which the Convention confers are obtained and that serious harm is being caused by the long delay in bringing the Convention into general operation. The Committee therefore ventures to address an urgent request to the Council that it will give the question of early ratification its most serious consideration at its next meeting.

"II.

"The Advisory Committee, after a careful examination of a large mass of information in regard to the illicit traffic in the drugs which has again been placed before it, reports to the Council that, while information continues to accumulate as to the huge extent of the traffic and the methods by which and the channels through which the drugs are smuggled, information is still almost completely lacking as to the sources from which the drugs are obtained by the illicit traffickers. The Committee regards it as one of the most urgent needs of the present moment that those sources should be discovered—and in view of the universal character of the menace and of the interest which all countries have in averting that menace from their own peoples, the Committee desires to urge as strongly as possible that a systematic and searching enquiry should be undertaken (if that has not already been done) without delay by the Governments of all the countries which manufacture the drugs or import them on a considerable scale with a view to discovering from whom and by what methods the illicit traffickers procure their supplies. The Committee recommends that, in addition to any methods of investigation which the Governments may think it desirable to employ for the purpose of this enquiry, a thorough examination should be made of the books, registers of purchasers and sales of the drugs, and other records of the manufacturers or importers of the drugs, and of all persons dealing in the drugs on a considerable scale, so as to track down the drugs to the point at which they reach the illicit traffickers; and all such manufacturers, importers and dealers should be required, for the purpose of the special enquiry proposed, to furnish full particulars in regard to any transactions which are not clearly proved to be destined for medical and scientific purposes.

---

[51] Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the work of the ninth session of the Committee held at Geneva from Jan. 17 to Feb. 3, 1927.

"Further, the Committee desires again to place on record its view that any such manufacturer, importer or dealer found to be knowingly supplying the drugs for other than medical or scientific purposes should, in addition to any penalty to which he may be liable under the laws in force, be prohibited from manufacturing, importing or dealing in any of the drugs for the future. The Committee would also urge that the greatest care should be taken to ensure that licenses to manufacture, purchase, import, export or deal in the drugs should only be issued by the Government authorities to persons who can fully establish the bonafide character of their business.

"III.

"The Committee requests the Council to invite the Secretary-General to call the attention of all Governments in Europe, and of such other Governments as appear likely to be interested in the matter, to the fact that enormous quantities of dangerous drugs are being exported to China by post. In this connection, the attention of these Governments should, it is suggested, be invited to Resolution IX appended to the report forwarded last year by the Committee to the Council. A copy of the list of seizures received by the Committee from the Chinese Maritime Customs—through the International Anti-Opium Association of Peking —should be forwarded, and the Governments should be requested to exercise special vigilance in the case of all postal matter destined for China in so far as this is possible.

"IV.

"The Committee:

"(1) Takes note of the fact that the Turkish Government has not replied to the letter sent out on the instructions of the Council on October 20th, 1926;

"(2) Requests the Secretary-General to arrange that, if no answer is received from the Turkish Government before the March meeting of the Council, the attention of the Council should be called to this omission.

"V.

"The Committee calls the attention of the Council to the difficulty experienced by the Committee in forming an opinion as to the exact situation of the traffic in opium and other dangerous drugs in Central and South America, due to the incomplete information at the Committee's disposal regarding these countries. The Committee therefore requests the Council to invite the Secretary-General to approach the Governments of these countries in order to obtain:

"(1) Regular annual reports to be despatched on October 1st of each year, and to be based on the model form now generally adopted;

"(2) Copies of the laws and regulations in force concerning the traffic in narcotics;

"(3) Information with regard to the administrative arrangements for enforcing the laws and regulations in vigour and, in particular, information as to the acceptance and application of the import and export certificate system;

"(4) Information as to whether these Governments intend to ratify, or adhere to, the Geneva Convention of February 19th, 1925;

"(5) Information as to the illicit traffic in narcotics in their respective countries;

"(6) In cases where the Hague Convention of 1912 has not yet been ratified and enforced, information as to when such ratification and enforcement may be expected.

"VI.

"The Committee desires to draw the attention of the Council to the necessity for controlling adequately the opium and drug traffic in free ports and free zones. It requests the Council to invite the Secretary-General to approach the Governments of countries where free ports and free zones exist, in all cases where these Governments have not already furnished information, with a view to obtaining complete lists of such free ports and zones, and statements as to whether the national legislation regarding opium and narcotic drugs is applied in these free zones or ports. Governments which do not apply their national drug regulations in the free ports or zones within their territories should be asked to furnish precise information as to the system of control they apply in such areas, and to forward copies of the relevant regulations.

"VII.

"The Committee requests the Council to invite the Secretary-General to approach the various Governments which forward reports, with the object of explaining to them that the annual reports should give statistics of actual imports and exports and not of the quantities which may have been authorised for import or for export. The object is to obtain statistics which represent the actual facts as regards import and export, as otherwise comparisons between the imports and exports of one country with the exports or imports of the corresponding country are rendered difficult or impossible.

"The Committee also recommends that, in cases where an exporting country authorises an export of narcotics to another country which has not accepted or applied the import and export certificate system, the exporting country should, in all cases, inform the country of destination of the fact that such an export authorisation has been given.

"VIII.

"The Committee notes that certain Governments which do not send regular annual reports on the traffic in opium and other dangerous drugs apparently omit to do so since the narcotic question appears to them to be of little or no domestic importance in their territories. The Committee wishes to point out that a country in which drug addiction is not prevalent and in which there is little or no traffic in narcotics may still, on account of its geographical position or for other reasons, be of importance from the point of view of control over the international narcotic traffic. The Committee therefore requests the Council to invite the Secretary-General to communicate with the Governments of the following States: Albania, Dominican Republic, Ethiopia, Haiti and Luxemburg, with the object of obtaining regular annual reports from these countries. The Committee suggests that, if this recommendation be approved, a separate letter should be issued to each such Government; in this letter a brief statement could be given of the reasons leading the Committee to attach special importance to the regular receipt of the report in question.

"IX.

"In view of the importance which the Committee attaches to the examination of the annual reports from Governments, and in order that these reports may be received in time for adequate examination, the Committee requests the Council to invite the Secretary-General to send each year to all Governments, two months before the date fixed for the despatch of their report, a letter expressing the hope that they will be in a position to forward their report on or before the due date.

"X.

"In view of the geographical position of Estonia and Lithuania, which renders these two countries important from the point of view of the transit of drugs between certain manufacturing and consuming countries, the Committee requests the Council to invite the Governments of Estonia and Lithuania to furnish as detailed information as possible with regard to their laws and regulations relating to the import, export and transit of narcotic drugs, and also to supply copies of any laws and regulations in force governing the internal trade in opium and drugs. It would be of great assistance to the Committee if the Government of Lithuania, which has already accepted the import and export certificate system, would be good enough to state whether that system is now effectively applied."

During its March, 1927, session, the Council passed the following resolutions:

"The Council decides to reappoint M. Henri Brenier and Colonel Arthur Woods to serve as assessors on the Advisory Committee on Traffic in Opium and Other Dangerous Drugs for a further period of one year from April 1, 1927. The

Council wishes to express its appreciation of the services of these assessors during the past year.

"The Council further decides to appoint Mr. L. A. Lyall to serve on the Advisory Committee as the assessor having knowledge of conditions in the Far East. This appointment is also made for one year, expiring April 1, 1928."

"I. The Council notes the report and resolutions of the Advisory Committee on Traffic in Opium and Other Dangerous Drugs passed during this Ninth Session and adopts the present report.

"II. The Council, being of the opinion that the calling of an extraordinary session of the Advisory Committee at a later date to discuss the question of the illicit traffic may well be desirable, asks the Secretary-General to communicate this opinion to the chairman of the Committee and to empower him in the name of the Council, to call such a session at a date not later than immediately after the next session of the Assembly, should the circumstances warrant such action."

In its report to the Eighth Assembly, the Fifth Committee states: [52]

"The Advisory Committee concluded from the documents in its possession that the illicit traffic in drugs continues to be a grave danger. The Advisory Committee points out in its report the necessity for a general and vivid appreciation of what that traffic means in terms of human suffering, misery and degradation. It goes on to make the very serious statement that, with regard to combating the drug evil, action by the Governments falls far short of their contractual obligations; but neither the Committee nor the League is in a position to grapple with this huge problem except to the extent to which they are aided in that task by individual Governments; the possibilities of direct executive action are necessarily confined to these individual Governments, acting not only within their national territories but also in direct co-operation with each other.

"The Fifth Committee wishes to draw the special attention of the Assembly to the gravity of the statements made by the Advisory Committee, a body of specialists who undoubtedly possess the most intimate knowledge and the widest experience of the subject. A very grave charge is made against the individual Governments, and the documents published by the Advisory Committee support, it must be admitted, to the very fullest extent the view it has expressed as to the danger of the situation. The Fifth Committee would like to make an appeal to the Assembly delegates that they should all, on their return to their respective countries, urge upon the competent authorities there the necessity for drastic action.

"The Advisory Committee has, in its second resolution, made a definite recommendation, namely, that a systematic and searching enquiry should be undertaken without delay by the Governments of all the countries which manufacture the drugs or import them on a considerable scale with a view to discovering from whom and by what methods the illicit traffickers procure their supplies. One method of investigation has been indicated in that resolution, and the Fifth Committee cannot too strongly recommend to the Assembly delegates that they should do all in their power in their own countries to see that the Committee's request is complied with.

---

[52] Report of the Fifth Committee to the Assembly, September 16, 1927. A. 64. 1927. XI.

"A very important exchange of views took place in the Advisory Committee on the subject of a resolution submitted to that Committee by the representative of the Italian Government. The Italian representative proposed that the Advisory Committee should hold an extraordinary session, with a view to drawing up concrete proposals for the reduction of the quantities of drugs manufactured to the quantities required for medical and scientific purposes, and also with regard to combating the contraband traffic in drugs, with special reference to the causes which produce it and including penal and other measures which might be adopted to suppress it. In the course of the discussion, it became clear—though there was no formal proposition on the subject, and no vote was taken on it—that a majority of the members were either in favour of or would not oppose the calling of an extraordinary meeting of the Advisory Committee to discuss the question of the illicit traffic generally, provided that the discussion at such a meeting were limited to measures which fell within the scope of the Hague Convention or of the Geneva Convention of 1925. The Advisory Committee preferred to leave the matter to the appreciation of the Council, and the Council, being of opinion that the calling of an extraordinary session of the Advisory Committee to discuss the question of the illicit traffic might well be desirable, empowered the Chairman of the Committee to call such a session should circumstances warrant such action. An extraordinary session has now been summoned for September 28th.

"The Advisory Committee has also pointed out the importance of the bringing into force of the Geneva Convention of February 19th, 1925. It states that great difficulties will continue to be encountered in dealing with the huge illicit traffic unless the further powers which the Convention confers are obtained and that serious harm is being caused by the long delay in bringing the Convention into general operation.

"The situation in China is the subject of another resolution of the Advisory Committee, which recommends that all Governments should exercise special vigilance in the case of all postal matters destined for China in so far as this is possible.

"The Advisory Committee has again passed a resolution with regard to the ratification of the Hague Convention by Turkey. This question was considered by the Assembly of 1923 and also by the Assembly of 1926. Up to the present time, no reply has been received from the Turkish Government to the Secretariat's communications on this subject.

"The lack of information with regard to the exact situation as to the traffic in opium and other dangerous drugs in Central and South America has caused some anxiety. It was, however, a great satisfaction to the members of the Advisory Committee to see a representative for one of these countries, take part in their work for the first time, Bolivia having appointed a representative on the Committee. The Fifth Committee draws the special attention of the delegations from the Central and South American countries to Resolution 5 of the Advisory Committee, which deals with this point.

"Resolution 6, dealing with the necessity for controlling the opium and drug traffic in free ports and free zones, is of special importance to all countries in which free ports and free zones exist. Undoubtedly, these countries will take every possible measure to stop the leakage which may take place through such ports and zones as a consequence of inadequate control.

"Several resolutions deal with the necessity of furnishing reports on the commerce in drugs in the various countries. The Governments should not forget that the Hague Convention has already laid down special stipulations in this respect, and they will realise that lack of information is bound to hamper the work of the Committee.

"The Fifth Committee has the honour to submit to the eighth ordinary session of the Assembly the following resolution:

> " 'The Assembly notes with approval the report of the Advisory Committee on Traffic in Opium and the resolutions contained therein, and earnestly recommends them to the attention of the States Members of the League.' "

The resolution referred to above was adopted by the Assembly.

Another resolution passed by the same Assembly referred to the report of the Commission of Enquiry into the Production of Opium in Persia, as follows:

"The Assembly takes note of the report (document A.7.1927) of the Commission of Enquiry into the production of opium in Persia, of the observations of the Persian Government on that report, and of the letter from the Chairman of the Commission of Enquiry to the Secretary-General dated April 23, 1927.

"It expresses its sincere thanks to the members of the Commission for their valuable work and its high appreciation of the good will shown by the Persian Government in cooperating with the League in its attempt to reach a solution of the difficult and complicated problem of narcotic control.

"The Persian Government having declared that the success of its programme will, in large measure, depend on its obtaining liberty of action in tariff affairs and on the removal of the restrictive tariffs on Persian products which must be substituted for opium, the Assembly expresses the hope that the Governments concerned will give their earnest and favorable attention to those conditions and that the Persian Government will keep the League of Nations informed of the progress made in carrying out the scheme proposed for the gradual diminution of the cultivation of the opium poppy in Persia.

"It earnestly recommends to all countries concerned with the production and manufacture of dangerous drugs and their raw material, the enactment of legislation similar to that now proposed by the Government of Persia, or such equivalent action as will insure the necessary reduction of raw material and the manufacture of drugs."

According to the resolution of the Council of March 11, 1927, the Advisory Committee held an extraordinary session from September 28 to October 8, 1927. The resolutions passed at this session are the following:

"Resolution I.[53]

"The Committee desires to draw the special attention of the Council to Resolution I passed at the Committee's ninth session. Further experience has strengthened the conviction of the Committee of the absolute necessity, if the illicit traffic is to be adequately dealt with, of the powers which the Geneva Convention of 1925 confers. Until that Convention comes into operation, over as wide a field as possible, little progress can be hoped for in combating the illicit traffic. As twelve ratifications of, and six adhesions to, that Convention have now been recorded, the entry into vigour of the Convention depends solely on the action taken by the States Members of the Council. Four further ratifications by such States are necessary before the Convention comes into force. The Committee ventures to repeat its urgent request that the Council will give this question its most serious consideration at its next meeting.

"Resolution II.

"The Committee requests the Council to represent to the Government of China that it would prove of the greatest assistance to the Committee in its work if it were provided with a report as to all important seizures of narcotic substances effected by the Chinese Maritime Customs at the various ports and stations which are controlled by that service. Such reports would also help other Governments to prevent the illicit export of narcotics into China. The reports, to be of value, should be forwarded to the League as soon as possible after the end of each quarter; and they should contain all relevant details (such as quantities, description of packages, labels—of which samples should be sent whenever possible—route followed, origin of the goods if known, references to the bills of lading under which forwarded, name of consignor and consignee, and in general all details which will assist in tracing the origin of the goods and the precise manner in which they came to find their way into the illicit traffic).

"Resolution III.

"In view of the large seizures now being effected in several countries—seizures which in some cases exceed the volume of the illicit traffic—and the fact that all Governments do not give precise information as to the manner in which narcotic substances so seized are dealt with, thereby rendering it difficult to form an accurate idea as to the position of the traffic, the Committee requests the Council to be good enough to ask all Governments to state, in their annual reports, the precise manner in which such confiscated substances have been dealt with, and to give such other information as may be useful in regard to such confiscation or disposal.

"It will be observed that this resolution reproduces the wording of Article 22 (I) (e) of the Geneva Convention, which imposes an obligation of this character

---

[53] Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the Work of the Tenth Extraordinary Session of the Committee. Sept. 28 to Oct. 8, 1927. C. 521. M. 179-1927. XI. (O. C. 686 [1]).

in respect of the reports to be sent by the contracting parties to the Central. Board when the latter is constituted.

"*Resolution IV.*

"The illicit traffic undoubtedly continues 'on an enormous scale', it is 'backed by huge financial resources', and 'drugs are still being smuggled in very large quantities.' It appears impossible at present to restrict the export from producing countries of raw opium and coca leaves to the small quantity necessary to supply the medical needs of the world. Experience also shows that the smuggling of drugs can be restricted to a considerable extent, but cannot be wholly stopped by measures that fall short of complete control, in view of the great financial gains which ensue from the smuggling of even small quantities. If all drug factories were adequately controlled by their Governments the drug problem would in large measure be solved.

"The Committee therefore requests the Council to urge as insistently as possible upon all Governments Members of the League and parties to the Opium Conventions that all factories manufacturing dangerous drugs should be owned, or adequately controlled, by their Governments. Under either system the Governments would at least:

> "(1) Regulate, and require an accurate accounting of, all internal traffic, including the purchase of raw materials, manufacture, sales, distribution, storage;
>
> "(2) Strictly control the issue and possession of licences or authorisations for the manufacture, sale, distribution and storage of the drugs;
>
> "(3) Adopt, and rigidly enforce, the import and export certificate system.
>
> "(4) Strictly control the export of dangerous drugs to any country which does not enforce the import and export certificate system. Where this system is not in force in the importing country, the Government of the exporting country must satisfy itself, beyond reasonable doubt, that the demand is for legitimate purposes only. This precaution is particularly important, since the readiest route which the illicit traffic can follow is through those countries which do not enforce the import and export certificate system. It is recognised that this will present various difficulties until the Central Board has been constituted; but it is imperative that such control should be exercised, as far as that is practicable, by the exporting countries until the Central Board begins to function. Experience in certain countries has shown that, even in present circumstances, a large measure of effective control can in fact be exercised in such cases."

The report of the Advisory Committee was adopted by the Council during its session in December, 1927.

The report of the Committee also contains as an annex a table giving the current positions of the various governments in respect to ratification of the agreement and convention developing out of the First and Second Opium Conferences of 1925. The table is reproduced on the following page.

ANNEX

AGREEMENT DRAWN UP BY THE FIRST OPIUM CONFERENCE, FEBRUARY 11TH, 1925:

LIST OF SIGNATURES, RATIFICATIONS AND ADHESIONS

Signatures			*Ratifications*	
Agreement	*Protocol*	*Final Act*	*Agreement*	*Protocol*
France	France	France	France	France
Great Britain	Great Britain	Great Britain	Great Britain	Great Britain
India	India	India	India	India
Japan	Japan	Japan		
Netherlands	Netherlands	Netherlands	Netherlands	Netherlands
Portugal	Portugal	Portugal	Portugal	Portugal
Siam	Siam	Siam	Siam	Siam

CONVENTION DRAWN UP BY THE SECOND OPIUM CONFERENCE, FEBRUARY 19TH, 1925:

LIST OF SIGNATURES, RATIFICATIONS AND ADHESIONS

Signatures			*Ratifications*	
Convention	*Protocol*	*Final Act*	*Convention*	*Protocol*
Albania	Albania	Albania		
Australia	Australia	Australia	Australia	Australia
Austria				
Belgium		Belgium	Belgium	
		Bolivia		
Brazil		Brazil		
Bulgaria	Bulgaria	Bulgaria	Bulgaria	Bulgaria
Canada	Canada			
Chile	Chile			
Cuba	Cuba	Cuba		
Czechoslovakia	Czechoslovakia	Czechoslovakia	Czechoslovakia	
Denmark		Denmark		
France		France	France	
Germany	Germany	Germany		
Great Britain	Great Britain	Great Britain	Great Britain	Great Britain
Greece	Greece	Greece		
Hungary		Hungary		
India	India	India	India	India
Irish Free State		Irish Free State		
Japan	Japan	Japan		
Latvia	Latvia			
Luxemburg	Luxemburg	Luxemburg		
Netherlands	Netherlands	Netherlands		
New Zealand	New Zealand	New Zealand	New Zealand	New Zealand
Nicaragua	Nicaragua	Nicaragua		
Persia	Persia	Persia		
Poland		Poland	Poland	
Portugal	Portugal	Portugal	Portugal	Portugal
Kingdom of the Serbs, Croats and Slovenes	Kingdom of the Serbs, Croats and Slovenes	Kingdom of the Serbs, Croats and Slovenes		
Siam	Siam	Siam		
Spain		Spain		
Sudan	Sudan		Sudan	Sudan
Switzerland		Switzerland		
Union of South Africa	Union of South Africa		Union of South Africa	Union of South Africa
Uruguay		Uruguay		

Adhesions

Bolivia[1] (subject to ratification and to the Declarations given below)
Danzig
Dominican Republic (*ad referendum*)
Egypt
Monaco

Adhesions

Roumania (*ad referendum*)
Salvador
San Marino
Sarawak
Venezuela (*ad referendum*)

---

[1] Bolivia does not undertake to restrict the home cultivation or production of coca, or to prohibit the use of coca leaves by the native population.

The exportation of coca leaves shall be subject to control by the Bolivian Government by means of export certificates.

The Bolivian Government designates the following as places from which coca may be exported: Villazon, Yacuiba, Antofagasta, Arica and Mollendo. (See Minutes of second meeting.)

CHAPTER XI

CONTROL (*continued*)—NATIONAL

As far as we have been able to ascertain the first federal attempt at legislation to control the use of opium in the United States was made on February 9, 1909, when the act known as "An act to prohibit the importation and use of opium for other than medicinal purposes" was approved. This law was passed as the result of investigations made in the United States during the summer and autumn of 1908 by the American Opium Commission appointed under the Act of Congress approved May 27, 1908.

It is true that according to the treaty of 1880 with China the importation of opium to Chinese subjects in the United States was prohibited, but Wright[1] says that only Chinese subjects were affected and that in fact American citizens "continuously imported the drug in a form prepared for smoking," and "handed it over to Chinese subjects who distributed it throughout the country, not only to Chinese, but to any and all" who had "become addicted to the opium smoking habit." Further, it is true that before 1909 there existed tariff and internal revenue laws governing the admission of opium into the United States but the aim of these laws was the production of income.

Wright summarizes the tariff laws and their effect as follows: [1]

> "The first mention of opium in our tariff acts was in that of July 14, 1832, section 3, where, amongst other articles, it was exempt from duty. In the tariff act of March 2, 1833, section 5, opium is again mentioned and placed in the free list.
>
> "In the tariff acts that followed, the duty on opium frequently changed."
>
> * * * * *
>
> "In the tariff act of August 30, 1842, opium for the first time is made to pay a duty. In section 8, paragraph 2, of that act an impost of 75 cents per pound was placed on the drug. It will be noticed . . . that, in anticipation of the

---

[1] Opium Problem. Message from the President of the United States transmitting . . . a report of the International Opium Commission . . . Senate Doc. No. 377, 61st Congress. 2nd Session.

change of opium from the free list to the dutiable list, there was, during the year 1841, a large speculative importation of the drug. In the tariff act of July 30, 1846, Schedule E, opium, amongst other articles, was put in the ad valorem list and made to pay 20 per cent. The price of the drug about that time was in the neighborhood of $5 a pound, and there seems to have been some difficulty in regard to invoicing under an ad valorem tax, so that by the tariff act of March 3, 1857, a specific tax of $1 a pound was placed on the drug. In the year 1861 there were two tariff acts—that of March 2, imposing a duty of $1 and that of August 5, imposing a tax of $2 a pound on the drug. By the tariff act of June 30, 1864, the impost on crude opium was raised to $2.50 a pound. This increase in the rate on crude or medicinal opium appears to have been for revenue purposes. The duty of $2.50 per pound remained in force until the tariff act of July 14, 1870, when the impost on this form of the drug was reduced to $1 per pound. The latter rate was retained in the tariff act of March 3, 1883; but in the tariff act of October 1, 1890, the drug was again placed in the free list. It remained in the free list in the tariff act of August 27, 1894; but on the passage of the tariff act of July 24, 1897, it was again made to pay $1 a pound.

"The taking of crude or medicinal opium from the free list of the immediately preceding tariffs and the imposition of $1 a pound upon it in the Dingley Act seems to have been due to the fact that the manufacturers of morphia have succeeded in securing a duty of $1 an ounce on this alkaloid, a duty that was practically prohibitive.

"It will be noticed that, in anticipation of the transfer of crude or medicinal opium from the free to the dutiable list, there was in 1897 a large speculative importation of the drug. This speculative importation has slightly changed the relative values of the total of importations in ten-year periods. . . .

"It became clear in the early fifties that a large percentage of the opium imported in previous years was not crude opium for medicinal purposes but smoking opium imported into San Francisco and other Pacific ports with the primary intention of supplying the Chinese. Several volumes have since been published on the misuse of opium in this country, and in them it has been stated on what appears to be good authority that the habit of smoking opium began about 1860 to spread from our Chinese to the vicious elements of our white and black population. This was more particularly true of the Pacific coast."

* * * * *

"Since 1860 it may be said that we have a fairly complete record of the importations of this form of the drug, and in some measure it may be calculated what the effect of the admission of it to this country has had on our population as a whole.

"Just what the object was in placing a heavy ad valorem tax on smoking opium has not been determined. It was known in the early sixties that the use of the drug was demoralizing even to the Chinese, and it is probable that the heavy ad valorem taxation was with the object of excluding it from the country. Be this true or not, the heavy tax had one effect—the customs returns for this form of opium began to decline, and the collectors of customs on the

Pacific Coast found themselves confronted with serious smuggling operations. In spite of this, a still heavier ad valorem tax (100 per cent) was placed on it by the act of June 30, 1864. The customs returns for this form of the drug continued to recede, and smuggling operations were extended to a vast scale.

"Taking into consideration the cost of producing and carrying to our shores a pound of smoking opium, it was concluded by the collectors of customs that the drug could not bear a higher rate of taxation than $6 a pound; so that in the tariff act of July 14, 1870, it was taken from the ad valorem list and for the first time taxed specifically at $6 a pound. Under this rate it was admitted until the tariff act of March 3, 1883, when the specific tax was raised to $10 a pound. In the tariff act of October 1, 1890, the rate of smoking opium was increased to $12 a pound.

"It will be observed . . . that as the result of the high specific rate of $10 and $12 a pound the importation of smoking opium apparently fell off. But this was only apparent, for again collectors of customs on the Pacific coast were confronted with huge smuggling operations. In addition a large quantity of crude medicinal opium was turned into smoking opium in all parts of the country where Chinese had settled. The result of all this was a considerable correspondence between the Treasury Department and the collectors of customs as to the rate that smoking opium would bear without leading to clandestine operations.

"So vital had this question become that, on the 12th of January, 1888, Mr. C. S. Fairchild, the then Secretary of the Treasury, was impelled to write to the then Speaker of the House of Representatives, Mr. Carlisle, recommending the passage of a bill to prohibit the importation of the drug."

In his letter Mr. Fairchild states: [2]

"Sir: Under existing law the importation of opium containing less than 9 per cent of morphia is prohibited. Such opium may, however, be re-exported under the provisions of section 2937 of the Revised Statutes. The practical effect of this law is to induce the clandestine introduction of the drug in this form for use in the preparation of smoking opium.

"It is assumed that the object of the law in prohibiting the importation of opium in that condition was to prevent its use for the purpose mentioned, it being understood that smoking opium is chiefly prepared from the drug below the standard of purity named. In order to make this prohibition effective the privilege of re-exportation should be withdrawn.

"This prohibition should, in my opinion, be extended to opium prepared for smoking, on which the rate of duty was increased by the tariff act of 1883 from $6 to $10 per pound, presumably with the object of restricting its importation and use. Such has not, however, been the effect of the law, which has served rather to stimulate smuggling, extensively practiced by systematic organizations on the Pacific coast. Recently completed facilities for transcontinental transportation have enabled the opium smugglers to extend their illicit traffic to our Northern border. Although all possible efforts have been made by this Department to suppress this traffic, it is found practically impossible to do so.

---

[2] Ex. Doc. No. 79. House of Representatives 50th Congress. 1st Session.

> "If, however, Congress is not disposed to prohibit or restrict the importation of opium for smoking, and desires to obtain revenue therefrom the tax should be materially reduced so that the inducement to smuggling and attendant difficulties and expense of administering the law may be lessened."

Wright continues:

> "However, no effective action to prohibit importations of this form of opium resulted from the recommendation of Secretary Fairchild. On the contrary, the duty rate was raised to $12 per pound in the tariff act (October 1, 1890). Smoking opium continued to be imported through the customs houses, but in decreasing amounts as the result of the higher impost. The larger part of the market was now supplied by clandestine smoking opium or the same form surreptitiously manufactured from high-grade medicinal opium.
>
> "By the Dingley Act of July 24, 1897, the duty on smoking opium was again placed at $6 a pound, experience having at last taught that it could not bear a higher rate without begetting an extensive surreptitious manufacture or serious smuggling operations. The amount that passed through the customs houses under the latter act progressively increased from the time the act went into effect to the period we are reviewing."

The Internal Revenue Act of 1890 provided for a tax of $10 on all opium manufactured in the United States for smoking purposes and restricted the manufacture of such opium to citizens of the United States. Wright states that the Commissioner of Internal Revenue reported that no license was ever taken out under it.

The National Food and Drugs Act of 1906 also is of interest as an influence on the opium problem in the United States through its prohibition of the introduction of adulterated or misbranded drugs according to the following paragraph. It reads:

> "Sec. 2. That the introduction into any State or Territory or the District of Columbia from any other State or Territory or the District of Columbia, or from any foreign country, or shipment to any foreign country of any article of food or drugs which is adulterated or misbranded, within the meaning of this act, is hereby prohibited."

As Wright remarks, "the effect of this Act in diminishing the use of proprietary or patent compounds containing opiates has ever been extensive."

But as Wright concludes:

> "It seems clear as it concerns the continental United States that neither treaty, tariff, excise, nor other laws bore so heavily on the opium traffic, or on those engaged in it, as to regulate the importation and confine the use of crude or medicinal opium to legitimate medical channels. On the contrary, vast amounts

of this form of the drug have poured in ever-increasing quantities into the United States, while the opium-smoking habit, outlawed by nearly every State and municipality in the Union, appears to have been encouraged by the tariff and excise laws permitting its importation and manufacture."

Wright says in connection with the origin of the Act of 1909:

"Another aspect of the opium question loomed large and was most important to our government, considering that it had convened an International Opium Commission to study and report on the opium problem as it is seen in the Far East. While the diplomatic correspondence proceeded it became apparent to the Department of State that there was a large misuse of opium in the continental United States. When this had been sufficiently demonstrated by the opium commission, it became the bounden duty of our Government to take some steps to clear up the home problem before the American delegates to the International Opium Commission should be brought face to face with the delegations of the other powers. Otherwise the American people stood to be accused of living in a glass house that no doubt would have been shattered on their heads."

As a result of the investigations made in this country in 1908 the attention of the Government was called to two facts that had been disclosed,—first, that the federal government was legalizing the importation and manufacture of smoking opium contrary to the laws of most states and many municipalities and that this anomalous situation should be taken care of by legislation before the meeting of the International Commission at Shanghai; second, that state and municipal laws must necessarily be ineffective while there is unrestricted importation of crude or medicinal opium. It was contended that the manufacture and distribution of these drugs in interstate commerce should be controlled by the federal government through the Bureau of Internal Revenue.

As a result of this, Congress on February 9, 1909, approved an act which made it " . . . unlawful to import into the United States opium in any form or any preparation or derivative thereof" except "for medicinal purposes only, under regulations which the Secretary of the Treasury is hereby authorized to prescribe. . . . " The law further provided penalties for violations in the form of fines or imprisonments, defined the various preparations of opium, and designated certain ports—Baltimore, Boston, Chicago, Detroit, Honolulu, New Orleans, New York, Philadelphia, San Juan, San Francisco, Seattle and St. Louis at which the drug might be imported. The law further provided for the making of necessary regulations and the keeping of records of importations.

As to the results obtained by the act of 1909, Wright states:

> "In the practical working of this act and the regulations issued under it, legally imported opium is almost immediately lost sight of on leaving the customhouse; for, although the importer may import in good faith and sell to the manufacturer or jobber in equally good faith, it is not possible for any of them to guarantee that the ultimate receiver or seller of the drug in interstate commerce is handling it for strictly medical purposes. Importers have made a genuine attempt to comply with the provisions of the act and the regulations issued under it, but there can be no doubt that the regulations impose too heavy a responsibility on those who in good faith import the drug for the declared purposes. A proposed bill to supplement this defect in the act by placing the interstate traffic in opium and other habit-forming drugs under federal control will be submitted in a moment. But the glaring defect of the February act is that it contains no provision against the possible intrastate manufacture of smoking opium. It does no more than exclude this form of the drug from the United States. If all of the States had uniform laws, which, in addition to forbidding the sale and use of smoking opium, also prohibited its manufacture, and if such laws were effective, there would seem to be no need for action on the part of the National Government to prevent the manufacture of this form of the drug in the United States. But only a minority of the States have such laws, and they are not always effective. This lack of general and uniform state laws to prohibit the manufacture as well as the sale and use of opium prepared for smoking is a question for the urgent attention of the States and the national conference of commissioners on uniform state laws. But until uniform and effective state legislation is an accomplished fact, it would seem to be the duty of the National Government to devise a measure to supplement and complete the law of February 9, 1909, which governs the importation and the proposed measure about to be submitted to govern the manufacture and interstate traffic in this and other habit-forming drugs.
>
> "The opium problem in the United States as it now stands needs to be confined by a triangle. One side of that triangle has been laid down by the act of last February. The importation of opium prepared for smoking and of other forms of opium except for medicinal purposes is prohibited by that act. If the proposed act about to be submitted, or some other act of Congress to control the manufacture and interstate traffic in the drug passes and is approved, the second side of the triangle will have been laid down. The third side may be made from an internal-revenue act that will prohibitively tax the manufacture of smoking opium within the United States. It would seem that this third side could be had by amending the act of Congress of October 1, 1890, (26 Stat., 567), governing the manufacture of smoking opium in the United States."

Bills incorporating the ideas suggested in Wright's report as to the control of the opium problem in the United States were introduced in Congress in 1910 and several hearings were held before the Ways and

Means Committee of the House. At that time Mr. Wright explained the proposed bills as follows: [3]

"The proposed bills, as I have said to you, informally, Mr. Chairman, were drafted in the Department of State to correct the abnormal use of habit-forming drugs that has been laid bare by the investigations of the American delegates to the International Opium Commission. The American opium delegates were appointed two years ago under the authority of Congress (H. R.—21260, public, No. 141.). They were instructed by the Secretary of State to study the opium question as it appeared in the Far East, and in the United States, and in the Philippines. Before the meeting of the International Opium Commission at Shanghai, sufficient evidence was secured on which to draft a measure that would deal with one aspect of the question. As a result of investigations made in the summer of 1908, a bill was drafted in the Department of State, passed by Congress, and approved on February 9, 1909 (public, No. 221, H.R. 27427). That bill aimed to prohibit the exportation of opium in the United States except for medicinal purposes, and more especially to prohibit the importation of opium prepared for smoking.

"Since the meeting of the international commission at Shanghai, further investigation has been carried on in connection with the preparations for the forthcoming opium conference to be held at The Hague in the near future to complete the work of the Shanghai commission. A wide personal investigation has been made, and importers and manufacturers of opium and other habit forming drugs have been consulted, together with the state boards of pharmacy, representatives of state and national medical associations, some 1,200 leading physicians and surgeons, and many others; as the result the bills that are now before the committee have been drafted. It would seem from the advices that I have had from all sources that if the bills are passed and approved they would meet the abnormal conditions known to exist in the United States, and several measures besides the ones under review are before Congress aimed to correct the abuses that have been uncovered. But after a thorough study of all measures that have been proposed it has seemed to the American Opium Commission that the abuse can be best reached by the measures now under review, which placed the entire matter in the hands of the Treasury Department, acting through the Bureau of Internal Revenue. The first bill—H.R. 25240—is designed to amend a statute which provides for the manufacture of smoking opium within the United States under an internal revenue tax of $10 a pound (Act of Oct. 1, 1890 . . .) . . . This proposed admendment . . . imposing a prohibitory tax [4] on the manufacture of smoking opium in this country is designed to supplement the February act."

* * * * *

"The second bill, H. R. 25241, is all supplementary to the February act of last year. It is designed to place the entire interstate traffic in the habit-forming drugs under the administration of the Treasury Department. It is the opinion of the American Opium Commission that it would bring this whole traffic and the use of these drugs into the light of day and thereby create a public opinion against the use of them that would be more important, perhaps, than the act itself."

---

[3] Importation and Use of Opium. Hearing before the Committee on Ways and Means of the House of Representatives, 61st Cong., 2nd Sess. May 31, 1910.

[4] $200 per pound.

* * * * *

"Now in regard to H. R. 25242. . . . This bill is designed as an amendment, to make more effective the opium-exclusion act of February 9, 1909. Since that act was passed, several things have occurred that make it necessary to amend the law. That act prohibits the importation of opium except for medicinal purposes, and it is aimed especially at the importation of opium prepared for smoking. Since the passage of the act the Attorney-General has given an opinion, so I am informed by the Secretary of the Treasury, that importation of opium, in this case opium prepared for smoking, for immediate transshipment by sea does not constitute an importation under the act. The effect of this opinion is that importers at San Francisco are bringing large quantities of this obnoxious form of the drug to San Francisco, where it is immediately transshipped by sea to Mexico and then smuggled into the United States over the Mexican border. It has been a most trying task for the customs authorities to detect and prevent this smuggling. To correct the defect in the February act, an amendment has been drawn, the one under discussion, H. R. 25242, prohibiting any vessels, foreign or domestic, from bringing to the United States the substance or article known or designated as opium prepared for smoking. . . .

"A further amendment to the February act is necessary, as the result of certain conclusions reached by the International Opium Commission at Shanghai. That commission made a declaration to the effect that it was the duty of opium-producing countries to prohibit the exportation of all opium to a country prohibiting its entry. In conformity with this declaration, the Hongkong government has prohibited the exportation of opium prepared for smoking to the United States and the Philippines and has asked this Government to reciprocate.

"The typewritten amendment accompanying H. R. 25242 is designed to conform with the declarations of the Shanghai commission. It declares that it shall be unlawful to export or cause to be exported any opium or cocaine to countries prohibiting or regulating their entry, provided that these drugs may be shipped to a regulating country if the exporter conforms with the regulations in force in the importing country."

* * * * *

"We have a law prohibiting the importation of smoking opium—the act of February 9, 1909. What we need now is a federal law regulating the importation of medicinal opium, cocaine, etc., and the interstate traffic in these drugs, one that will bring the entire traffic into the open, one that will make it easy for the Federal officials to effectively execute it, and will be an aid to the State authorities in enforcing state laws. One good effect of the February law of last year has been to prevent the legal importation of opium prepared for smoking."

Several hearings were held on these bills, but they were not passed. It was not until January, 1914, that any bill on the subject was passed and on the seventeenth of that month two were approved.

One of them entitled "An Act to amend an Act entitled 'An Act to prohibit the importation and use of opium for other than medicinal purposes', approved February ninth, nineteen hundred and nine," covers practically the same material as H. R. 25242 above discussed.[5]

The second passed on January 17, 1914, corresponds in the main to H. R. 25240 except that the tax is $300 per pound instead of $200 and Section 5 of the old bill prohibiting interstate commerce in smoking opium is omitted.[6]

The bill regulating the production, manufacture, distribution, etc., of the drugs was finally passed as H. R. 6282 and approved on December 17, 1914. This Act—the so-called Harrison Narcotic Act—and amendments included in the Revenue Acts of 1918 and 1926, and the act of March 3, 1927, are briefly digested as follows: [7]

HARRISON ACT AND AMENDMENTS

DRUGS INCLUDED— Opium and coca leaves, and compounds, manufactures, salts, derivatives or preparations thereof.

Exceptions—
1. Certain preparations containing not more than two grains of opium, one-fourth grain of morphin, one-eighth grain of heroin or one grain of codein or any preparations of them in one ounce.
2. Liniments or preparations for external use except those which contain cocain or its preparations.

Providing:
1. That such preparations are manufactured and distributed for medicines and not for the purpose of evading the act;
2. That a record be kept by all parties handling these drugs of purchases and sales and that they shall register and pay a tax.
3. Decocainized coca leaves and other preparations which do not contain cocain are excepted.

PERSONS AFFECTED—
1. Every registered person who handles in any way any of these drugs.
2. Any person not registered under the provisions of this act who has these drugs in his possession.

---

[5] For text see Appendix V.

[6] For text see Appendix VII

[7] For text see Appendix VIII.

Exceptions—1. Employees of registered persons acting within the scope of their employment.
2. Nurses under the supervision of a physician, dentist or veterinary surgeon.
3. Possession of these drugs upon a prescription given in good faith.
4. United States, state, county, municipal, district, territorial or insular officer or official having possession of these drugs by reason of his official duties.
5. Warehousemen holding these drugs for a registered person.
6. Common carriers engaged in transporting such drugs.

DUTIES OF PERSONS AFFECTED—Group 1.—That they be registered, pay a tax and keep such records as may be required.

Group 2.—Possession unlawful.

TAXES— The law provides for both special and stamp taxes, graded according to the class of individuals concerned.

PURCHASE, SALE, ETC., OF DRUGS— The law also provides ways in which these drugs may be purchased and held in possession by registered persons. It makes exceptions as follows for unregistered persons:

1. Persons possessing these drugs when they have been obtained upon the prescription of a physician from a registered dealer providing the prescription is for a legitimate medical use and providing the container shows certain records.
2. The dispensing or administration of these drugs to a patient by a physician, dentist or veterinary surgeon in the course of his professional practice and for legitimate medical purposes.

Unstamped packages shall be subject to seizure except as herein provided.

The drug may be sold only on written order of such person to whom such article is sold on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue. Nothing in this paragraph shall apply to

1. Dispensing or distribution to a patient by a physician registered under the act in the course of his professional practice providing he keep a record.
2. Sale by a dealer to a consumer upon a written

prescription providing the prescription be recorded.

3. Sale or shipment by a person within the United States to a person in a foreign country.
4. The sale or giving away of these drugs to an officer of the United States, of a state, territory, district, county, municipality or insular possession.

It is unlawful for any person to obtain by means of order forms any of these drugs for use other than that comprised in the conduct of a lawful business or the legitimate practice of a profession. The law provides certain detailed regulations for the transportation of these drugs.

ADMINISTRATION— Commissioner of Prohibition with approval of Secretary of Treasury shall make needful rules and regulations for carrying out the provisions of this act. The inspection of records by agents of the Bureau of Prohibition is provided for as are penalties for violation of the law and the disposition to be made of seized drugs.

In compliance with the provisions of the Act of December 17, 1914, and amendments, regulations have been made by the Commissioner of Internal Revenue and later the Commissioner of Prohibition with the approval of the Secretary of the Treasury for carrying the provisions of the Act into effect. In what follows these regulations as adopted from time to time are digested briefly.

The main object of the law is to provide certain definite, legitimate channels through which the proscribed drugs shall pass from the time of their importation to that of their ultimate consumption and, further, to permit the verification of this object through certain machinery which shall permit a checking and tracing of the drugs in question.

With these ends in view certain individuals are selected as qualified to handle these drugs and all others are outlawed from such handling. Through registration, taxation, the making and reporting of inventories, the outlining of specific methods applicable to the different groups involved, such as importers, wholesale dealers, retail dealers, practitioners, and institutions in which the participants are held severally and jointly responsible, the machinery for carrying out the purpose of the law is developed. The details of these regulations, while essential to the enforcement of the law, have no direct bearing upon the problem under consideration and, therefore, will not be presented here. Those regulations having to do directly with the practice of medicine and hence involved intimately with the development and control of the problem follow in greater detail.

One of the latter regulations is contained in Treasury Decision 2809, dated Mar. 20, 1919, and M-Mim. 2212, dated July 31, 1919, reported in Regulation 35 as follows:

> "An order purporting to be a prescription issued to an addict or habitual user of narcotics, not in the course of professional treatment in an attempted cure of the habit, but for the purpose of providing the user with narcotics sufficient to keep him comfortable by maintaining his customary use is not a prescription within the meaning and intent of the act; and the persons filling and receiving drugs under such an order, as well as the person issuing it, will be regarded as guilty of violation of the law. (See T. D. 2809, dated Mar. 20, 1919.)
>
> "Exceptions.—Exceptions to this rule may be properly recognized (1) in the treatment of incurable disease, such as cancer, advanced tuberculosis, and other diseases well recognized as coming within this class, where the physician directly in charge of a bona fide patient suffering from such disease prescribes for such patient, in the course of his professional practice and strictly for legitimate medical purposes, and in so prescribing, indorses upon the prescription that the drug is dispensed in the treatment of an incurable disease; and (2) where the attending physician prescribes for an aged and infirm addict whose collapse from the withdrawal of the drug would result in death and in which case he indorses upon the prescription that the patient is aged and infirm, giving age, and that the drug is necessary to sustain life. (See M.-Mim. 2212, dated July 31, 1919.)"

The next regulation of interest here, as having to do with the practitioner of medicine, the retail dealer, and the patient or consumer is Pro-Mimeograph No. 217 issued October 19, 1921, outlining the treatment of "narcotic drug addiction" permissable under the Harrison Narcotic Law as follows:

> "In accordance with the recent decisions of the courts . . . and the attitude of the medical profession on the subject generally, as indicated below, the provisions of M-Mim. 2212, dated July 31, 1919, are hereby amended and the following provisions as to the proper procedure to be followed in the prescribing and dispensing of narcotic drugs are issued for the guidance of narcotic agents in charge and others concerned.
>
> "It should be borne in mind that these instructions must necessarily be general in their nature, as it is impossible to lay down an inflexible rule which will cover all cases; and that they are subject to modification through further interpretation of the law by the courts:
>
> "1. Use of Narcotics in the Treatment of Disease Without Reference to the Question of Addiction.

"Without reference to the question of addiction, a physician acting in accordance with proper medical practice may prescribe or dispense narcotics for the relief of acute pain or for any acute condition, such as influenza, pneumonia, renal calculi, broken limbs, etc.

"2. Use of Narcotics in the Treatment of Incurable Disease.

"A reputable physician directly in charge of bona fide patients suffering from diseases known to be incurable, such as cancer, advanced tuberculosis, and other diseases well recognized as coming within this class, may in the course of his professional practice, and strictly for legitimate medical purposes, dispense or prescribe narcotic drugs for such diseases, provided the patients are personally attended by the physician, that he regulates the dosage, and prescribes no quantity greater than that ordinarily recognized by members of his profession to be sufficient for the proper treatment of the given case. Physicians will be held accountable if through carelessness or lack of sufficient personal attention the patient secures more narcotic drugs than are necessary for medical treatment, and devotes part of his supply to satisfy addiction. The physician should clearly set forth on each prescription the date issued, and the full name and address of the patient, and describe in indisputable terms the exact nature of the ailment for which issued. It would not be lawful under any circumstances to place in the hands of an addict, through prescription or otherwise, a sufficient quantity of narcotic drugs to last a week. In incurable and aged and infirm cases, geographically isolated, where it would otherwise work extreme hardship, and where there is no danger of maladministration or diversion to illegitimate use, the physician in charge may, at his own risk, upon obtaining permission from the narcotic agent in charge of the district, prescribe or dispense a week's supply or more, safeguarding the same by placing it for administration in the custody of a responsible nurse or attendant. Accurate records must be kept of such prescribing and administration.

"3. Use of Narcotics in the Treatment of Addiction Only.

"Mere addiction alone is not recognized as an incurable disease. It seems necessary, however, to divide the addicts not suffering from an incurable disease into two classes: (a) Those suffering from senility, or the infirmities attendant upon old age, who are confirmed addicts of years standing, and who, in the opinion of a reputable physician in charge, require a minimum amount of narcotics in order to sustain life; and (b) those whose addiction is not complicated either by incurable disease or by the infirmities attendant upon old age.

"(a) Aged and infirm addicts.—Addicts suffering from senility, or the infirmities attendant upon old age, and who are confirmed addicts of years standing, for all intents and purposes, may be treated in the same manner as addicts suffering from incurable disease. In such cases, where narcotic drugs are necessary in order to sustain life, a reputable physician may prescribe or dispense the minimum amount necessary to meet the absolute needs of the patient. As in the treatment of those addicts suffering from incurable diseases, physicians will be held accountable if through carelessness or lack of sufficient personal attention the patient, by securing more narcotic drugs than necessary for his medicinal treatment, is able to devote part of his supply merely to satisfy addiction. In this class of cases the physician issuing the prescription should make a statement on the prescription to the effect that the patient is aged and infirm, giving age, and certifying that the drug is necessary to sustain life.

"(b) The ordinary addict.—It is well established that the ordinary case of addiction yields to proper treatment, and that addicts will remain permanently cured when drug taking is stopped and they are otherwise physically restored to health and strengthened in will power. This bureau has never sanctioned or approved the so-called reductive ambulatory treatment of addiction, however, for the reason that where the addict controls the dosage he will not be benefited or cured. Medical authorities agree that the treatment of addiction, with a view to effecting a cure, which makes no provisions for confinement while the drug is being withdrawn, is a failure, except in a relatively small number of cases where the addict is possessed of a much greater degree of will power than that of the ordinary addict. The good faith of the physician and the bona fides of his treatment in a given case will be established by the facts and circumstances of the case and the consensus of medical opinion with regard thereto, based on the experience of the medical profession in cases of similar nature. The following resolution passed by the Council on Health and Public Education of the American Medical Association at its meeting on November 11, 1920, is pertinent in determining the period over which narcotic treatment should be extended in purely addiction cases:

> " 'Be it resolved, That the Council on Health and Public Education of the American Medical Association indorse the principle expressed in the California law which forbids the use of opium and its derivatives in the withdrawal treatment of those addicted to the use of these drugs for a period of more than thirty days after the commencement of the withdrawal treatment.'

"This bureau can not under any circumstances sanction the treatment of mere addiction where the drugs are placed in the addict's possession, nor can it sanction the use of narcotics to cover a period in excess of 30 days, when personally administered by the physician to a patient either in a proper institution or unconfined. If a physician, pursuant to the so-called reductive ambulatory treatment, places narcotic drugs in the possession of the addict who is not confined, such action will be regarded as showing lack of good faith in the treatment of the addiction, and that the drugs were furnished to satisfy the cravings of the addict.

"Doubtful cases, or those not falling within any of the above instructions, upon request, will be investigated and special instructions based upon the recommendations of the inspecting officers will be issued."

* * * * *

"Note.—Synopsis of court decisions referred to in paragraph 1.

"Prescribing for 'Dope Fiends.'

"The United States Supreme Court has determined that a physician who sells, dispenses, or distributes narcotic drugs, not in the course of his regular professional practice, and not for the treatment of any disease, but to a person popularly known as a 'dope fiend,' for the purpose of gratifying his appetite for the drug as an habitual user thereof, violates the provisions of the Harrison Narcotic Law, and thereby becomes subject to punishment as provided therein. It was also determined that an order issued by a practicing and registered physician for morphine to an habitual user thereof, the order not being issued by him in the course of professional treatment, in the attempted cure of the habit, but being issued for the purpose of providing the user with morphine sufficient to keep him comfortable by maintaining his customary use, is not a physician's prescription within exception (b) of section 2 of the said act. (U. S. v. C. T. Doremus; W. S. Webb and Jacob Goldman v. U. S. T. D. 2809.)

"Guilty Knowledge of Druggists.

"The Circuit Court of Appeals for the Fifth Circuit has determined that the undisputed facts (1) that the physician issued prescriptions only for narcotics; (2) that many of the alleged patients were described in his prescriptions as addicts and had the physical appearance of such; and (3) that the prescriptions were issued to the same person repeatedly and over long periods of time and without diminution in the quantity prescribed, indicating that no cure by reduction was intended by the physician, warranted the conclusion that the druggists must have known when they filled such prescriptions that they had been issued merely to satisfy addiction. In the same case it was further held that an instruction erroneously authorizing a conviction on a trial for abetting a violation of the Harrison Narcotic Law by a druggist, though the druggist had no actual knowledge that a prescription was wrongfully issued, was not ground for reversal, where reasonable men could have drawn but one inference, that the druggist had such actual knowledge. (C. T. Doremus v. U. S., T. D. 3085.)

"Intervening Agency Does Not Affect Guilt.

"The United States District Court, Southern District of New York, recently determined that where for consideration the defendant issued an order or 'prescription' for opium not in the course of his regular professional practice, but to an 'addict' for a prohibited use which was as intended presented to and filled by a dealer, who had no reason to believe it had been wrongfully issued, the defendant committed an indictable offense, although the offense was consummated through an innocent agency, that the injunction of the statute had been violated by the defendant's willful procurement and participation and the quality of his act is not affected by the fact that another agency innocently cooperated. (U. S. v. Emil H. Keidanz, unreported to date.)

"When Prescribing and Selling are Synonymous.

"The Supreme Court of the United States has determined that an indictment was sufficient which charged that defendant, a practicing physician, did feloniously, etc., sell, exchange, barter and give away a specified quantity of morphine sulphate to a person named, not pursuant to an order form issued by the Commissioner of Internal Revenue, by issuing and dispensing a prescription to such person, not a patient of the physician, which morphine was dispensed and distributed by the physician not in the course of his professional practice only; that 'selling' in the criminal sense is not confined to the parting with one's property; and that under section 332 of the Criminal Code, and section 2 of the Harrison Act, one may take a principal part in the prohibited sale of an opium preparation by unlawfully issuing a prescription to a would-be purchaser; hence there is no necessary repugnance between prescribing and selling. (Jin Fuey Moy v. U. S., T. D. 3127.)

"Moral Purpose of Law.

"The Circuit Court of Appeals, Eighth Circuit, in explaining the object of this law, stated that although enacted under the taxing power of Congress, it no doubt was intended to prevent the growing use of narcotics, deemed by Congress a menace to the Nation, and that the act has a moral end, as well as revenue in view. This decision further held that a physician who dispenses narcotics not in good faith for the purpose of securing a cure of one suffering from an illness, or to cure him from the narcotic habit, violates the law, and affirmed the conviction of a physician who was charged with furnishing narcotics to an addict in decreasing quantities, claimed to be in an attempt to cure addiction, where it was shown that such physician did not personally attend the addict or give him personal attention sufficient to show that he was practicing in good faith. (Bascom C. Thompson v. U. S., T. D. 2887.)

"Selling Exempt Preparations to Addicts.

"The Circuit Court of Appeals, Fourth Circuit, has determined that the sale of a so-called exempt preparation under section 6 of the Harrison Narcotic Act, as amended, to wit, paregoric, not as a medicine, but for purpose of evading the intentions and provisions of the act by supplying addicts with said preparation to satisfy addiction, is unlawful, and that an indictment substantially in the language of section 6 was not only sufficient, but was unnecessarily specific in negativing the exceptions of sale for medicinal purposes by alleging the sale was not as medicine, but for purpose of evading the act. It was also determined that in a prosecution for the sale without a license of a preparation containing opium contrary to the Harrison Narcotic Act, section 6, evidence that sales were knowingly made to drug addicts was sufficient to go to the jury on the question of intent by defendant to evade the provisions of the act and that a charge that the purposes of the act were, first, to obtain a license tax, and incidentally to prevent sales being made to addicts, was not error. (Oliver v. U. S., 267 Fed. Rep. 544.)

"Prescriptions for Regular Patients.

"The United States Circuit Court of Appeals, Fourth Circuit, determined that when a physician is charged with unlawfully selling or prescribing drugs under the Harrison Act, the case turns largely upon his good faith in prescribing drugs to his regular patients, for maladies requiring the administration of the drug, or whether he prescribed for persons seeking his professional aid

> merely to procure the drug. It further stated that in the latter case the physician might perhaps in a single instance afford temporary relief for one whose condition demanded immediate treatment, but to go further than this would enable every doctor to do just what the defendant in that case did, furnish drugs to addicts, or afford opportunity to them to procure all the narcotics they desired, as unrestrained they would go from one physician to another and thus quickly destroy the whole purpose of the act in question. (Louis D. Barbot v. U. S., No. 1839, U. S. C. C. A., 4th Circuit, unreported to date.)"

On January 12, 1923 a regulation was passed and approved amending the original article 117 of the regulations as to the wording of the "Exceptions" paragraph. It permits physicians to use on their prescriptions for narcotics given to patients suffering from incurable disease the phrase "Exception (1) Art. 117" instead of the phrase "incurable disease" or the name of the disease and in cases of aged and infirm patients the phrase "Exception (2) Art. 117" instead of "Aged and infirm" with the age and the statement that the drug is necessary to maintain life.

The next regulation is Pro. Mim. Pro. No. 316, dated May 21, 1923, as follows:

> "Pro-Mimeograph Pro. No. 217, dated October 19, 1921, is hereby revoked, and the following outline of procedure to be followed in prescribing and dispensing narcotics is issued for the guidance of narcotic agents in charge, and others concerned. This pamphlet is intended to be advisory only and to anticipate and answer questions arising in the minds of practitioners in regard to the law and regulations governing the prescribing and dispensing of narcotic drugs as interpreted by the courts.
>
> "The regulations governing this subject are contained in article 117, Regulations 35, as amended by Treasury Decision 3426, and read as follows:
>
> > "'*Purpose of issue*—A prescription, in order to be effective in legalizing the possession of unstamped narcotic drugs and eliminating the necessity for use in order forms, must be issued for legitimate medical purposes. An order purporting to be a prescription issued to an addict or habitual user of narcotics, not in the course of professional treatment in an attempted cure of the habit, but for the purpose of providing the user with narcotics sufficient to keep him comfortable by maintaining his customary use is not a prescription within the meaning and intent of the act; and the persons filling and receiving drugs under such an order, as well as the person issuing it, will be regarded as guilty of violation of the law. (See T. D. 2809, dated Mar. 20, 1919.)
> >
> > "'*Exceptions*—Exceptions to this rule may be properly recognized (1) in the treatment of incurable disease, such as cancer, advanced tuber-

culosis, and other diseases well recognized as coming within this class, where the physician directly in charge of a bona fide patient suffering from such disease prescribes for such patient, in the course of his professional practice and strictly for legitimate medical purposes, and in so prescribing, indorses upon the prescription that the drug is dispensed in the treatment of an incurable disease (or if he prefers he may indorse upon the prescription "Exception (1) article 117"); and (2) where the attending physician prescribes for an aged and infirm addict whose collapse from the withdrawal of the drug would result in death and in which case he indorses upon the prescription that the patient is aged and infirm, giving age, and that the drug is necessary to sustain life (or if he prefers he may indorse upon the prescription "Exception (2), article 117").

"General.

"It is impossible to state an inflexible rule which will cover all cases, and this outline must, therefore, be general in nature and subject to modification through further interpretation of the law by the courts. The bureau is not charged with the duty of laying down any fixed rule as to the furnishing of drugs or the frequency of the prescriptions in any particular case.[8] This responsibility rests upon the physician in charge of the case.[9] While the primary responsibility rests upon the physician in charge, a corresponding liability also rests upon the druggist who knowingly fills an improper prescription or order whereby an addict is supplied with narcotics merely for the purpose of satisfying his addiction.[10] Caution should be exercised to avoid being imposed upon by

---

[8] "In a prosecution against a physician for violating Harrison narcotic law by dispensing narcotics to habitual users of the drugs, the exclusion of a letter from the Commissioner of Internal Revenue in response to a query by defendant physician as to dispensing of narcotics held proper. (Thompson v. United States, 258 Fed. 196).

[9] "Indictment which charged that defendant, a practicing physician, did feloniously, etc., sell, exchange, barter, and give away a specified quantity of morphine sulphate to a person named, not pursuant to an order on a form issued by the Commissioner of Internal Revenue by issuing and dispensing a prescription to such person, not a patient of the physician, which morphine was dispensed and distributed by the physician, not in the course of his professional practice only, was sufficient. (Jin Fuey Moy v. United States, 254 U. S. 189.)

[10] "(a) The acts of the principal become the acts of the accessory or aider, and he may be charged as having done the act himself, and be indicted and punished accordingly, under Penal Code, section 332, making the accessory a principal. (DiPreta v. United States, 270 Fed. 73.)

"(b) A person dealing in drugs is required to ascertain at his peril whether that which he sells comes within the statute, so that an indictment for violation of that section need not allege that defendant knew the character of drug sold. (United States v. Balint, 66 L. Ed. 352, 42 S. C. R. 301.)

"(c) Nothwithstanding Harrison Narcotic Act, section 2, exception (b), except-unscrupulous persons, and too much credence should not be given to the unsupported statements of the addict himself, because the confirmed addict will go far beyond the truth in an attempt to secure an ample supply of narcotic drugs with which to satisfy his cravings.

"The good faith of the physician and the bona fides of his treatment in a given case will be established by the facts and circumstances of the case and the consensus of medical opinion with regard thereto, based on the experience of the medical profession in cases of similar nature.[11] Physicians will be charged with violation of the law if through carelessness or lack of sufficient personal attention the patient secures more narcotic drugs than are necessary for medical treatment and devotes part of his supply to satisfy addiction.[12]

---

ing sales of the prohibited drugs on the written prescription of a registered physician, a sale by a druggist, who knows that the prescription was issued to gratify the holder's appetite and not to cure disease or alleviate suffering, violates the law, and the physician issuing the prescription, knowing it is to be filled by a druggist having such knowledge, aids and abets the violation.

"Knowledge by a druggist that a prescription under the Harrison narcotic law was issued to gratify the holder's appetite, and not to cure disease or alleviate suffering, is essential to guilt, and negligent failure to inquire will not take the place of knowledge.

"On a trial for aiding and abetting violation of the Harrison narcotic law, exceptions to the charge on the ground that there was no evidence of the facts hypothesized by the court in its instruction respecting knowledge, and knowledge was immaterial when the sale was made on the prescription of a registered physician, did not raise the point, presented no appeal, that the charge authorized conviction, though the druggist had not actual knowledge if he negligently failed to make inquiry. (Doremus v. United States, 262 Fed. 849.)

[11] "(a) Expert testimony as to proper method of treating addicts admissible. (Reeves v. United States, 263 Fed. 690.)

"(b) In a prosecution under Harrison Narcotic Act, section 2, against a physician who sold large quantities of narcotics to habitual users of the drug, medical testimony as to recognized methods among physicians for treating persons addicted to the use of narcotic drugs was admissible for the purpose of showing that the accused physician did not come within the exception as to physicians dispensing drugs in the course of their practice, for, while the act is in the guise of a revenue measure it was intended to accomplish a moral purpose. (Thompson v. United States, 258 Fed. 196.)

[12] "An order issued by practicing and registered physician for morphine to an habitual user thereof, the order not being issued by him in the course of professional treatment in the attempted cure of the habit, but being issued for the purpose of providing the user with morphine sufficient to keep him comfortable by maintaining his customary use, is not a physician's prescription within exception (b) of section 2 of the Harrison Narcotic Act. (Webb and Goldbaum v. United States, 249 U. S. 96.)

"Use of Narcotics in the Treatment of Disease Without Reference to the Question of Addiction.

"Without reference to the question of addiction, a physician acting in accordance with proper medical practice may prescribe or dispense narcotics for the relief of acute pain or for any acute condition, such as influenza, pneumonia, renal calculi, broken limbs, etc.

"Use of Narcotics in the Treatment of Incurable Disease.

"A reputable physician directly in charge of bona fide patients suffering from diseases known to be incurable, such as cancer, advanced tuberculosis, and other diseases well recognized as coming within this class, may in the course of his professional practice, and strictly for legitimate medical purposes, dispense or prescribe narcotic drugs for such diseases, provided the patients are personally attended by the physician who regulates the dosage, and prescribes no quantity greater than that ordinarily recognized by members of his profession to be sufficient for the proper treatment of the given case.[13] The danger of supplying persons suffering from incurable diseases with a supply of narcotics must be borne in mind, because such persons may use the narcotics wrongfully, either by taking excessive quantities or by disposing of a portion of the drugs in their possession to other addicts or persons not lawfully entitled thereto.[14] The physician should indorse upon the prescription that the drug is dispensed in the treatment of an incurable disease, or if he prefers he may indorse upon the prescription 'Exception 1, article 117.'[15]

---

[13] "(a) In prosecution of physicians for having violated and conspired to violate the Harrison Narcotic Act, the trial court in his general charge properly submitted an issue as to the good faith of defendants in issuing their prescriptions to supposed patients, since the defendants could only protect themselves if the prescriptions were issued legitimately in their practice. (Melanson v. United States, 266 Fed. 783.)

"(b) In a prosecution for violation of Harrison Narcotic Act, section 2, by selling narcotic drugs, not in pursuance of written orders on the prescribed forms, evidence that defendant, although a physician registered under the act, did not dispense the drugs in good faith in the course of his professional practice, which would bring him within exeception (a) of the statute, but sold the same to gratify the appetite of the purchasers, was competent and relevant, and such issue was properly submitted to the jury. (Oakshette v. United States, 260 Fed. 830.)

[14] "(a) A careful review of the decisions as they exist at the present time makes clear the fact that when a physician is charged with unlawfully selling or prescribing drugs under the Harrison Act, the case turns largely upon his good faith in prescribing drugs to his regular patients for maladies requiring the administration of the drug or whether he prescribed for persons seeking his professional aid merely to procure the drug. In the latter case the physician might, perhaps, in a single instance afford temporary relief for one whose condition demanded immediate treatment. To go further than this would enable every doctor to do just what the defendant did here—furnish drugs to addicts or afford opportunity to them to procure all the narcotics they desired—as unrestrained they would go from one physician to another, and thus quickly destroy the whole purpose of the act in question. (Louis D. Barbot v. United States, 273 Fed. 919.)

"Use of Narcotics in the Treatment of Addiction Only.

"Mere addiction alone is not recognized as an incurable disease. It seems necessary, however, to divide the addicts not suffering from an incurable disease into two classes: (a) Those suffering from senility or the infirmities attendant upon old age, who are confirmed addicts of years standing, and who, in the opinion of a reputable physician in charge, require a minimum amount of narcotics in order to sustain life; and (b) those whose addiction is not complicated by incurable disease or by the infirmities attendant upon old age.

"(a) *Aged and infirm addict.*—Addicts suffering from senility or the infirmities attendant upon old age and who are confirmed addicts of years standing may be, for the purpose of enforcing the law, treated as addicts suffering from incurable diseases. In such cases, where narcotic drugs are necessary in order to sustain life, a reputable physician may prescribe or dispense the minimum amount necessary to meet the absolute needs of the patient. In this class of cases the physician issuing the prescription should make a statement on the prescription to the effect that the patient is aged and infirm, giving age, and certifying that the drug is necessary to sustain life, or, if he prefers, he may indorse upon the prescription 'Exception 2, article 117.'

"(b) *The ordinary addict.*—It is well established that the ordinary case of addiction yields to proper treatment, and that addicts will remain permanently cured when drug taking is stopped and they are otherwise physically restored to health and strengthened in will power. This bureau has never sanctioned

---

"(b) The purpose of antinarcotic act is to confine the distribution of narcotics to the regular and lawful course of professional practice, and not every order therefor written by a duly registered physician in the form of a prescription is necessarily a prescription within the exception. If the offense is a statutory one, and intent or knowledge is not made an element of it, the indictment need not charge such intent or knowledge. An indictment charging that defendant, a duly registered physician, by means of three prescriptions sold to one whom he knew to be a drug addict, at one time heroin, morphine, and cocaine equivalent to more than 3,000 ordinary doses, without directions or restrictions as to the use thereof by the addict, shows the sale was not within the exception to antinarcotic act. (United States v. Behrman, 66 L. Ed. 345; 42 S. C. R. 303.)

"(c) A physician held chargeable with the offense of selling opium in violation of Harrison Act, section 2, where for a consideration he issued an order or prescription for opium not in the regular course of his practice, but to an addict, for a prohibited use, although the prescription was filled by a dealer who acted in good faith and without knowledge that it was wrongfully used. (United States v. Emil H. Keidans, 270 Fed. 585.)

[15] "A physician who writes prescriptions for unusual quantities of drugs or a dealer who fills such a prescription is guilty of an offense unless the prescription indicates the necessity for such an unusual quantity. (United States v. Curtis, 229 Fed. 288.)

or approved the so-called reductive ambulatory treatment of addiction, however, for the reason that where the addict controls the dosage he will not be benefited or cured. Medical authorities agree that the treatment of addiction, with a view to effecting a cure, which makes no provision for confinement while the drug is being withdrawn, is a failure, except in a relatively small number of cases where the addict is possessed of a much greater degree of will power than that of the ordinary addict.

"Special advice to cover cases not falling within these instructions will, upon request, be furnished by this office."

An Act of Congress, approved March 3, 1927,[15a] created a Bureau of Prohibition and a Commissioner of Prohibition, and transferred from the Commissioner of Internal Revenue to the Prohibition Commissioner the enforcement of the Harrison Narcotic Act as amended. Under this new arrangement the Bureau of Prohibition of the Treasury Department issued, effective January 1, 1928, "Regulations No. 5 Relating to the Importation, Manufacture, Production, Compounding, Sale, Dispensing and Giving away of Opium or Coca Leaves, their Salts, Derivatives or Preparations thereof under the Act of December 17, 1914, as amended."

These regulations included the substance of previous regulations herein considered, except those which have been revoked as already noted. In addition, new regulations included under Article 105 of Regulations No. 5 were adopted as follows:

"*Prescriptions unnecessary.*—Preparations or remedies which are within the exemption may be sold with or without prescriptions, and a prescription for such a preparation may be refilled, provided, of course, the preparation is furnished in good faith for medicinal purposes only. The filling or refilling of narcotic prescriptions calling for more than one exempt preparation or a mixture consisting of an exempt preparation or remedy further reduced or diluted by the addition of non-narcotic medicinal agents is authorized, provided, of course, the preparation is furnished in good faith for medicinal purposes.

"*Extemporaneous prescriptions.*—An extemporaneous prescription calling for narcotic drugs not in excess of the amounts specified in section 6 may be refilled in the same manner as a prescription calling for ready-made preparations or remedies, provided the mixture is sold in good faith for medicinal purposes only, and a record is kept of the sale in the manner indicated in article 107."

Under Article 108 of Regulations No. 5 the following is given:

"*Compromise.*—Section 3229, Revised Statutes, provides in part:

> "The Commissioner of Internal Revenue, with the advice and consent of the Secretary of the Treasury, may compromise any civil or criminal case arising under the internal revenue laws instead of commencing suit thereon;

[15a] For text see Appendix VIII.

> and, with the advice and consent of the said Secretary and the recommendation of the Attorney General, he may compromise any such case after a suit thereon has been commenced.

"Under the provisions of section 3229, R. S. the act of March 3, 1927, and Prohibition Treasury Decision No. 1, dated April 1, 1927, as amended, the Commissioner of Prohibition, with the advice and consent of the Secretary of the Treasury has authority to compromise any civil or criminal cases arising under this act instead of commencing suit thereon; and, with the advice and consent of the said Secretary and the recommendation of the Attorney General, he may compromise any such case after suit thereon has been commenced. Forms 656, which must accompany any offer submitted, may be obtained upon request from the narcotic agent in charge or the collector and must be forwarded with the amount tendered to the collector. Offers in compromise in order to receive consideration must be voluntarily made. It is not the policy to compromise violations of this act where willful intent is shown."

The next natural step would be a recital of the results of the legislation passed and designed to exert a favorable influence in retarding the growth of the problem. While at first sight this may appear a simple procedure, as a matter of fact, a proper evaluation of the Harrison Narcotic Law as interpreted and administered would require a very exhaustive sociologic and scientific study such as heretofore has never been made and which the Committee on Drug Addictions has not been in a position to make. The difficulties attending the sociological aspects of such a study are apparent when it is noted, as has been pointed out in a preceding chapter, that there is no accurate knowledge for purposes of comparison as to the extent of chronic opium intoxication in the United States at any given period. Further the very nature of the illicit traffic is such as to handicap to a considerable degree any investigations, inasmuch as it has removed from legitimate channels of distribution very considerable amounts of the proscribed drugs. Furthermore, due to the interpretation placed on "legitimate medical purposes" by certain regulations, it is apparent that an accurate determination of the nature of the condition, about which there is at the present time considerable difference of opinion, must precede any attempt at evaluation of the operation of the law and its regulations. It will be seen readily, for example, that if the act itself, the regulations, and the administrative policies are based upon the assumption that chronic opium intoxication once thoroughly established constitutes a pathologic entity which is beyond the individual's power to control, they cannot result in solving the problem if this assumption is wrong and if, on the other hand, the nature of the condition proves to be little more than the expression of a vicious habit or desire. Likewise the converse is true. For if the problem really consists of a very complex mingling of etiologic influences and physiologic and psychical reactions, it will be seen that no policy of administration which does not take these factors into consideration, which is in itself inelastic and which does not give to the administrator the utmost latitude for dealing with individual cases and does not provide for the appointment of experienced and intelligent enforcement officers can possibly operate effectively.

However, it may be of interest to the reader if we point out the features of the law as enforced to which objections of one kind or another have been raised. The following are the principal ones concerning which discussions and difference of opinion have arisen.

Section 2, paragraph "a" of the act permits a physician to dispense or distribute the proscribed drugs to a patient "in the course of his professional practice only," providing record is kept, except when the physician personally attends the patient. Further section 8 permits the possession of the drug if prescribed "in good faith" by a registered physician, dentist, or veterinary surgeon. As the act does not define "professional practice" and "in good faith," many critics claim that the interpretation of these phrases in the regulations promulgated by the Bureau of Internal Revenue have been unwarranted and that the indictment and prosecution of reputable physicians for exercising their judgment in this connection have been unjust.

In other words, the attitude of many physicians is that the law prevents members of the medical profession and pharmacists from legally supplying these cases with the drug which they are accustomed to using and for the use of which they are not responsible, in that this use was acquired and developed through medical treatment, and yet no provision is made for their care. It is pointed out that there is a very general lack of provision by states and municipalities for the medical treatment of these cases; that general hospitals as a rule will not accept them; that special hospitals have not been provided, and that in many instances individuals of small means have no choice of treatment except in hospitals for the insane and those connected with prisons to both of which not unnaturally they hesitate to have themselves committed. It is also claimed that even in cases where abundant means are available the patient already has learned from past experiences that treatment in a great many private and public institutions is incompetent and by no means free from risk to health and even life, and that the results obtained are such as to discourage repetition.

This has resulted, it is claimed, in strongly deterring physicians from handling these cases with the result that large numbers of honest and reputable men and women have been forced to seek relief through the only means available to them, namely, the illicit traffic.

It must be borne in mind that members of the medical profession who hold this attitude claim that "professional practice" and "legitimate medical purposes" both are subserved fully by the supplying of opium preparations to selected individuals accustomed to their use for many reasons that should be left to the judgment of the individual practitioner and not made the subject of an arbitrary ruling.

An instance of disagreement between this group of critics and the Bureau of Internal Revenue as to what constitutes "professional practice" and "in good faith" is brought out by a consideration of article 117 of Regulations 35, 1919.

There is a group of physicians who do not agree that all cases of chronic opium intoxication except those with an incurable, intercurrent malady such as cancer, tuberculosis, etc., and aged and infirm users can be treated successfully. They claim that there are certain cases who, although not suffering from such a malady, nevertheless suffer intermittently or periodically from certain painful conditions which of themselves would necessitate a return to the use of the drug at more or less frequent intervals and certain other cases who have reached such a state of dependence on an opium preparation as to preclude—perhaps because of constitutional factors, perhaps because of our incomplete knowledge—the possibility of successful treatment except at the risk of chronic invalidism. Even the plainly curable cases, according to this group, have certain rights and should be entitled to a legal supply of their drug for varying periods of time until their physical condition, domestic, economic, or other affairs may render it convenient for them to undergo treatment directed at permanent cure. To force such cases to take treatment is, they state, bad medical practice and as long as the use of the drug is carried on without interference with the rights or privileges of others, it should be considered a matter of individual liberty, with the physician as the sole judge as to the desirability of undertaking curative treatment.

It has been pointed out also that to attempt any differentiation through the age of the patient and the length of the period during which he has been using the drug is neither scientific nor warranted by known facts.

This regulation was amended on October 19, 1921 in Pro. Mimeograph Pro. No. 217, which further outlined the "treatment of narcotic drug addiction permissible under the Harrison Narcotic Law." In addition to criticism of the features similar to those contained in the previous regulation, objection to the treatment permitted under this regulation has been raised by some physicians. They claim that, if a physician is sufficiently skillful and the patient is possessed of average honesty and perseverance, the so-called "ambulatory treatment" may be successful at least for the major part of the treatment. It has been claimed also that one of the longest known and well recognized forms of treatment, namely, that involving gradual reduction, may not be concluded successfully within the space of thirty days as required by the regulation. Indeed, according to some of its chief advocates, in gradual reduction it is sometimes necessary temporarily to cease the reduction and even to increase the amount of the drug given, of which individual needs the regulation takes no cognizance.

Criticism has been made also of that portion of this regulation which reads: " . . . provided the patients are personally attended by the physician, that he regulates the dosage, and prescribes no quantity greater than that ordinarily recognized by members of his profession to be sufficient for the proper treatment of the given case. Physicians will be held accountable if through carelessness or lack of sufficient personal attention the patient secures more narcotic drugs than are necessary for the medical treatment, and devotes part of his supply to satisfy his addiction." This, according to certain physicians, is an incongruous and impossible situation. They claim that as the continued administration of opium preparations causes the development of so-called addiction, once this condition is established it may be eliminated only by curative treatment which alone would permit the complete cessation of the administration of the drug. The fact that an individual patient is suffering from an incurable malady such as cancer in no way militates against the development of this addiction and to require the physician to give only as much of the drug as is necessary to relieve the cancer or other pain and not enough to relieve what they claim is a need arising from the addiction alone is impossible. In other words, the development of tolerance to increasing doses of the drug used for the relief of the painful cancer condition also results in a dependence on the drug. This regulation apparently overlooks this fact and also the fact that as tolerance for the drug develops its analgesic effect is correspondingly lost, and if enough of the drug is given to relieve the pain incident to the intercurrent malady the dependence or addiction is of necessity automatically "satisfied," i.e., the patient is comfortable. In other words when, as a result of continued administration in increasing doses, tolerance and dependence —addiction—have developed it is no longer possible to relieve the pain from the intercurrent malady alone.

Under these circumstances, according to certain physicians, the risks involved are so great as a result of the interpretation of this regulation that practitioners of medicine hesitate to administer opium preparations even to individuals suffering from conditions which the regulation apparently exempts, with the result that these cases as well as those who do not suffer from an intercurrent malady requiring the use of opium become dependent upon the illicit traffickers. In other words, a physician treating cases of this nature is not safe from unwarranted indictment and may be called upon at any time in court to prove his innocence to the detriment of his social, professional, and economic standing and to bring equally disastrous notoriety to his patient, all for the reason that the local inspector charged with the enforcement of the law is apparently not conversant with its requirements, with the rights of the physician, or with the needs of the case.

In the paragraph above partially quoted it is also stated that the patients must be "personally attended by the physician." In Regulations 35, Art. 126, issued by the Bureau of Internal Revenue the phrase "in personal attendance" has been interpreted as meaning that the physician shall be in attendance upon the patient away from his office, i.e., presumably in the patient's home or in a hospital or other institution. It is well known that cases of cancer, tuberculosis, and other diseases requiring the continued use of opium for the relief of pain or other symptoms still may be able to visit the physician's office or even to pursue an occupation or profession over long periods of time. To require that these patients be visited away from their physicians' offices would entail upon them an additional expense, residence in an institution, or at least serious personal inconvenience which, it is claimed, in no way assists in the proper administration of the law.

It should be noted that the regulation above referred to was revoked and superseded by the regulation dated May 21, 1923, entitled Pro-Mimeograph Pro-Number 316. The intent of this regulation appears to be more liberal than that of the preceding one in that it omits the statement to the effect that in the use of narcotics in the treatment of incurable diseases and in the treatment of aged and infirm cases "physicians will be held accountable if through carelessness or lack of sufficient personal attention the patient secures more narcotic drugs than are necessary for medical treatment, and devotes part of his supply to satisfy addiction," and reference to the period of time in which treatment of addiction alone must be completed. In view of the omission of these objectionable features from the latest regulation, several of the criticisms above noted become invalid as far as the present administration of the law is concerned. However, during the period in which the earlier regulations operated, if the above-named criticisms were justified, they deterred unwarrantably members of the medical profession from the handling of the cases involved. As a result the patients were driven to the illicit trafficker for their supplies and to this extent the regulations themselves contributed to the ever-increasing complexity of the problem. Also there still remain the original objections which have been advanced by certain physicians as outlined above.

In general it is the contention of these critics that no patients are so hedged about with arbitrary restrictions as are those suffering from chronic opium intoxication and that in relation to no other condition are the judgment of the physician and his methods of procedure, the result of his medical training and education, brought so unwarrantably into discussion and controversy with the risk of indictment for illegal practice.

However, others claim that the regulations are sound and well-conceived and work no undue hardship; that the continuation of the use of opium preparations by those accustomed thereto is without necessity; and that physicians who supply such cases are no better than the drug peddlers. They further claim that the so-called "ambulatory treatment" must in all cases be a failure; that the methods of treatment available are good; that thirty days is a sufficient length of time for the successful treatment of all curable cases; that the public institutional provisions already in existence are sufficient and that if discharged patients return to the use of their drug it is the fault of the patient and not the fault of the treatment.

With presumably honest, highly intelligent and well-equipped practitioners holding these different points of view, it seems fair to assume that more than a mere matter of opinion is involved and that the sharp division of opinion must be the result of misunderstanding or incomplete knowledge as to the fundamental nature of the condition known as narcotic addiction. It would appear, therefore, that medical and sociologic studies as above indicated are needed before any complete evaluation of the law and its enforcement may be made.

As a result of the enforcement of the law and its regulations a number of cases of alleged violation have been brought to trial. The court decisions rendered in relation to these cases have been used by the Bureau of Internal Revenue as the basis for a revision of the earlier regulations and the promulgation of new ones. For a study of the relation of these decisions to the regulations involved, the reader is referred to the synopsis of the decisions included with the text of the regulations given in the preceding pages.

A more recent court decision not included in those just mentioned is comprised in the following: [16]

"Mr. Justice McReynolds delivered the opinion of the Court.

"The court below affirmed the conviction of petitioner by the District Court, Eastern District of Washington, under the following count of an indictment returned therein June 26, 1922. As to all other counts the jury found him not guilty.

> " 'Count II. And the Grand Jurors aforesaid upon their oaths do further present: That Charles O. Linder, whose other or true name is to the Grand Jurors unknown, hereinafter in this indictment called the defendant, late of the County of Spokane, State of Washington, heretofore, to-wit; on or about the first day of April, 1922, at Spokane, in the Northern Division of the Eastern District of Washington, and within the jurisdiction of this Court, did then and there violate the Act of December 17, 1914, entitled "An Act to provide for the registration of, with Collectors of Internal Revenue, and to impose a special tax upon all persons who produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away opium or coca leaves, their salts, derivatives, or preparations, and for other purposes," as amended February 24, 1919, in that he did then and there knowingly, wilfully and unlawfully sell, barter and give to Ida Casey a compound, manufacture

---

[16] C. O. Linder vs. The United States of America. On Writ of certiorari to the U. S. Circuit Court of Appeals for the Ninth Circuit. Supreme Court of the U. S. No. 183. October Term, 1924. (April 13, 1925.)

> and derivative of opium, to-wit: one (1) tablet of morphine and a compound, manufacture and derivative of coca leaves, to-wit: three (3) tablets of cocaine, not in pursuance of any written order of Ida Casey on a form issued for that purpose by the Commissioner of Internal Revenue of the United States; that the defendant was a duly licensed physician and registered under the Act; that Ida Casey was a person addicted to the habitual use of morphine and cocaine and known by the defendant to be so addicted; that Ida Casey did not require the administration of either morphine or cocaine by reason of any disease other than such addiction; that the defendant did not dispense any of the drugs for the purpose of treating any disease or condition other than such addiction; that none of the drugs so dispensed by the defendant was administered to or intended by the defendant to be administered to Ida Casey by the defendant or any nurse, or person acting under the direction of the defendant; nor were any of the drugs consumed or intended to be consumed by Ida Casey in the presence of the defendant, but that all of the drugs were put in the possession or control of Ida Casey with the intention on the part of the defendant that Ida Casey would use the same by self-administration in divided doses over a period of time the amount of each of said drugs dispensed being more than sufficient or necessary to satisfy the cravings of Ida Casey therefor if consumed by her all at one time; that Ida Casey was not in any way restrained or prevented from disposing of the drugs in any manner she saw fit and that the drugs so dispensed by the defendant were in the form in which said drugs are usually consumed by persons addicted to the habitual use thereof to satisfy their craving therefor and were adapted for consumption. Contrary to the form of the statute in such case made and provided and against the peace and dignity of the United States.'

"The Harrison Narcotic Law, approved Dec. 17, 1914, c. 1, 38 Stat. 785—twelve sections—is entitled: 'An Act to provide for the registration of, with collectors of internal revenue, and to impose a special tax upon all persons who produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away opium or coca leaves, their salts, derivatives, or preparations, and for other purposes.'

"Sec. 1 provides—'That on and after the first day of March, nineteen hundred and fifteen, every person [with exceptions not here important] who produces, imports, manufactures, compounds, deals in, dispenses, sells, distributes, or gives away opium or coca leaves or any compound, manufacture, salt, derivative, or preparation thereof, shall register with the Collector of Internal Revenue,' and shall pay a special annual tax of one dollar. Also, 'It shall be unlawful for any person required to register under the terms of this Act to produce, import, manufacture, compound, deal in, dispense, sell, distribute, or give away any of the aforesaid drugs without having registered and paid the special tax provided for in this section. . . . The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall make all needful rules and regulations for carrying the provisions of this Act into effect.'

"Sec. 2 provides—'That it shall be unlawful for any person to sell, barter, exchange, or give away any of the aforesaid drugs except in pursuance of a written order of the person to whom such article is sold, bartered, exchanged, or given, on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue.' [The giver is required to retain a duplicate and the acceptor to keep the original order for two years, subject to inspection.] 'Nothing contained in this section shall apply—

> "'(a) To the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist, or veterinary surgeon registered under this Act in the course of his professional practice only: Provided, That such physician, dentist, or veterinary surgeon shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date, and the name and address of the patient to whom such drugs are dispensed or distributed, except such as may be dispensed or distributed to a patient upon whom such physician, dentist, or veterinary surgeon shall personally attend; and such record shall be kept for a period of two years from the date of dispensing or distributing such drugs, subject to inspection, as provided in this Act.
>
> "'(b) . . (c) . . (d) . .

"'The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall cause suitable forms to be prepared for the purposes above mentioned. . . . It shall be unlawful for any person to obtain by means of said order forms any of the aforesaid drugs for any purpose other than the use, sale, or distribution thereof by him in the conduct of a lawful business in said drugs or in the legitimate practice of his profession. . . .'

"Sec. 8. 'That it shall be unlawful for any person not registered under the provisions of this Act, and who has not paid the special tax provided for by this Act, to have in his possession or under his control any of the aforesaid drugs; and such possession or control shall be presumptive evidence of a violation of this section, and also of a violation of the provisions of Section One of this Act: *Provided,* That this section shall not apply to any employee of a registered person, or to a nurse under the supervision of a physician, dentist, or veterinary surgeon registered under this Act, having such possession or control by virtue of his employment or occupation and not on his own account; or to the possession of any of the aforesaid drugs which has or have been prescribed in good faith by a physician, dentist, or veterinary surgeon registered under this Act; or to any United States, State, county, municipal, District, Territorial, or insular officer or official who has possession of any said drugs, by reason of his official duties, or to a warehouseman holding possession for a person registered and who has paid the taxes under this Act; or to common carriers engaged in transporting such drugs: *Provided further,* That it shall not be necessary to negative any of the aforesaid exemptions in any complaint, information, indictment, or other writ or proceeding laid or brought under this Act; and the burden of proof of any such exemption shall be upon the defendant.'

"Sec. 9. 'That any person who violates or fails to comply with any of the requirements of this Act shall, on conviction, be fined not more than $2,000 or be imprisoned not more than five years, or both, in the discretion of the court.'

"Section 1 was amended by the Act of February 24, 1919, c. 18, 40 Stat. 1057, 1130. This increased the special annual tax to twenty-four dollars on importers, manufacturers, producers and compounders, twelve dollars on wholesale dealers, six dollars on retail dealers, and three dollars on 'physicians, dentists, veterinary surgeons and other practioners lawfully entitled to distribute, dispense, give away, or administer any of the aforesaid drugs to patients upon whom they in the course of their professional practice are in attendance.' It also added a provision requiring that stamps—one cent for each ounce—should be affixed to every package of opium, coca leaves, any compound, salt, derivative or preparation thereof, produced in or imported into the United States and sold or removed for consumption or sale, and then, the following paragraph—

"'It shall be unlawful for any person to purchase, sell, dispense, or distribute any of the aforesaid drugs except in the original stamped package or from the original stamped package; and the absence of appropriate tax-paid stamps from any of the aforesaid drugs shall be prima facie evidence of a violation of this section by the person in whose possession same may be found; and the possession of any original stamped package containing any of the aforesaid drugs by any person who has not registered and paid special taxes as required by this section shall be prima facie evidence of liability to such special tax: *Provided,* That the provisions of this paragraph shall not apply . . . to the dispensing, or administration, or giving away of any of the aforesaid drugs to a patient by a registered physician, dentist, veterinary surgeon, or other practioner in the course of his professional practice, and where said drugs are dispensed or administered to the patient for legitimate medical purposes, and the record kept as required by this Act of the drugs so dispensed, administered, distributed, or given away.'

"Manifestly, the purpose of the indictment was to accuse petitioner of violating Section 2 of the Narcotic Law, and the trial court so declared. Shortly given the alleged facts follow. Petitioner, a duly licensed and registered physician, without any official written order therefor, knowingly, wilfully and unlawfully did sell, barter and give to Ida Casey one tablet of morphine and three tablets of cocaine; he knew she was addicted to habitual use of these drugs and did not require administration of either because of any disease other than such addiction, and he did not dispense them for the treatment of any other disease or condition; they were not administered by him or by any nurse or other person acting under his direction, nor were they consumed or intended for consumption in his presence; the amount was more than sufficient to satisfy the recipient's cravings if wholly consumed at one time; petitioner put the drugs into her possession expecting that she would administer them to herself in divided doses over a period of time; they were in the form in which addicts usually consume them to satisfy their cravings; the recipient was in no way prevented or restrained from disposing of them.

"Petitioner maintains that the facts stated are not sufficient to constitute an offense. The United States submit that, considering *United States* v. *Behrman,* 258 U. S. 280, the sufficiency of the indictment is clear.

The trial court charged—

> "'If you are satisfied beyond a reasonable doubt that defendant knew that this woman was addicted to the use of narcotics, and if he dispensed these drugs to her for the purpose of catering to her appetite or satisfying her cravings for the drug, he is guilty under the law. If, on the other hand, you believe from the testimony that the defendant believed, in good faith this woman was suffering from cancer or ulcer of the stomach, and administered the drug for the purpose of relieving her pain, or if you entertain a reasonable doubt upon that question, you must give the defendant the benefit of the doubt and find him not guilty.'

"In effect, the indictment alleges that the accused, a duly registered physician, violated the statute by giving to a known addict four tablets containing morphine and cocaine with the expectation that she would administer them to herself in divided doses, while unrestrained and beyond his presence or control, for the sole purpose of relieving conditions incident to addiction and keeping herself comfortable. It does not question the doctor's good faith nor the wisdom or propriety of his action according to medical standards. It does not allege that he dispensed the drugs otherwise than to a patient in the course of his professional practice or for other than medical purposes. The facts disclosed indicate no conscious design to violate the law, no cause to suspect that the recipient intended to sell or otherwise dispose of the drugs, and no real probability that she would not consume them.

"The declared object of the Narcotic Law is to provide revenue, and this court has held that whatever additional moral end it may have in view must 'be reached only through a revenue measure and within the limits of a revenue measure.' *United States* v. *Jin Fuey Moy,* 241 U. S. 394, 402. Congress cannot, under the pretext of executing delegated power, pass laws for the accomplishment of objects not entrusted to the Federal Government. And we accept as established doctrine that any provision of an Act of Congress ostensibly enacted under power granted by the Constitution, not naturally and reasonably adapted to the effective exercise of such power but solely to the achievement of something plainly within power reserved to the States, is invalid and cannot be enforced. *McCulloch* v. *Maryland,* 4 Wheat. 316, 423; *License Tax Cases,* 5 Wall. 462; *United States* v. *DeWitt,* 9 Wall. 41; *Keller* v. *United States,* 213 U. S. 138; *Hammer* v. *Dagenhart,* 247 U. S. 251; *Child Labor Tax Case,* 259 U. S. 20. In the light of these principles and not forgetting the familiar rule, that 'a statute must be construed, if fairly possible, so as to avoid not only the conclusion that it is unconstitutional but also grave doubts upon that score,' the provisions of this statute must be interpreted and applied.

"Obviously, direct control of medical practice in the States is beyond the power of the Federal Government. Incidental regulation of such practice by Congress through a taxing Act cannot extend to matters plainly inappropriate and unnecessary to reasonable enforcement of a revenue measure. The enactment under consideration levies a tax, upheld by this court, upon every person who imports, manufactures, produces, compounds, sells, deals in, dispenses or gives away opium or coca leaves or derivatives therefrom, and may regulate medical practice in the States only so far as reasonably appropriate for or merely incidental to its enforcement. It says nothing of 'addicts' and does not undertake to prescribe methods for their medical treatment. They are diseased and proper subjects for such treatment, and we cannot possibly conclude that a physician acted improperly or unwisely or for other than medical purposes solely because he has dispensed to one of them, in the ordinary course and in good faith, four small tablets of morphine or cocaine for relief of conditions incident to addiction. What constitutes bona fide medical practice must be determined upon consideration of evidence and attending circumstances. Mere pretense of such practice, of course, cannot legalize forbidden sales, or otherwise nullify valid provisions of the statute, or defeat such regulations as may be fairly appropriate to its enforcement within the proper limitations of a revenue measure.

"*United States* v. *Jin Fuey Moy, supra,* points out that the Narcotic Law can be upheld only as a revenue measure. It must be interpreted and applied accordingly. Further, grave constitutional doubts concerning Section 8 cannot be avoided unless limited to persons who are required to register by Section 1. Mere possession of the drug creates no presumption of guilt as against any other person.

"In *United States* v. *Doremus,* 249 U. S. 86, 93, 95, a registered physician was accused of unlawfully selling, giving away and distributing five hundred one-sixth grain tablets of heroin without official written order. Another count charged selling, dispensing and distributing five hundred such tablets not in the course of regular professional practice. The trial court held Section 2 invalid because it invaded the police power of the State. This court declared: 'Of course Congress may not in the exercise of Federal power exert authority wholly reserved to the States. . . . If the legislation enacted has some reasonable relation to the exercise of the taxing authority conferred by the Constitution, it cannot be invalidated because of the supposed motives which induced it. . . We cannot agree with the contention that the provisions of Section 2, controlling the disposition of these drugs in the ways described, can have nothing to do with facilitating the collection of the revenue, as we should be obliged to do if we were to declare this Act beyond the power of Congress acting under its constitutional authority to impose excise taxes.' The sharp division of the court in this cause and the opinion in *Jin Fuey Moy's Case* clearly indicated that the statute must be strictly construed and not extended beyond the proper limits of a revenue measure.

"*Webb* v. *United States,* 249 U. S. 96, 99, came here on certified questions. Two were answered upon authority of *Doremus' Case.* The third inquired whether a regular physician's order for morphine issued to an addict, not in the course of professional treatment with design to cure the habit, but in order to provide enough of the drug to keep him comfortable by maintaining his customary use, is a 'physician's prescription.' The answer was that 'to call such an order for the use of morphine a physician's prescription would be so plain a perversion of meaning that no discussion of the subject is required.' The lower court had sought instruction in order that it might decide the particular cause. The question specified no definite quantity of drugs, nor the time intended for their use. The narrated facts show, plainly enough, that physician and druggist conspired to sell large quantities of morphine to addicts under the guise of issuing and filing orders. The so-called prescriptions were issued without consideration of individual cases and for the quantities of the drugs which applicants desired for the continuation of customary use. The answer thus given must not be construed as forbidding every prescription for drugs, irrespective of quantity, when designed temporarily to alleviate an addict's pains, although it may have been issued in good faith and without design to defeat the revenues. This limitation of the reply is confirmed by *Behrman's Case,* 258 U. S. 280, *(infra)* decided three years later, which suggests at least that the accused doctor might have lawfully dispensed some doses.

"In *Jin Fuey Moy* v. *United States,* 254 U. S. 189, 194, doctor and druggist conspired to sell opiates. The prescriptions were not issued in the course of professional practice. The doctor became party to prohibited sales. 'Manifestly the phrases "to a patient" and "in the course of his professional practice only" are intended to confine the immunity of a registered physician, in dispensing the narcotic drugs mentioned in the Act, strictly within the appropriate bounds of a physician's professional practice, and not to extend it to include a sale to a dealer or a distribution intended to cater to the appetite or satisfy the craving of one addicted to the use of the drug. A "prescription" issued for either of the latter purposes protects neither the physician who issues it nor the dealer who knowingly accepts and fills it.'

"The quoted language must be confined to circumstances like those presented by the cause. In reality, the doctor became party to sales of drugs. He received a fixed sum per dram under guise of issuing prescriptions. The quoted words are repeated in *Behrman's Case,* which recognizes the possible propriety of prescribing small quantities.

"*United States* v. *Balint,* 258 U. S. 250, 253, 254, hold—'It is very evident from a reading of it [Sec. 2] that the emphasis of the section is in securing a close supervision of the business of dealing in these dangerous drugs by the taxing officers of the Government and that it merely uses a criminal penalty to secure recorded evidence of the disposition of such drugs as a means of taxing and restraining the traffic.'

"*United States* v. *Behrman,* 258 U. S. 280, 287, came up under the Criminal Appeals Act. The indictment charged that Behrman, a registered physician, did unlawfully sell, barter and give to one King, an 'addict,' one hundred and fifty grains of heroin, three hundred and sixty grains of morphine and two hundred and ten grains of cocaine, by issuing three prescriptions. Further, that the drugs were not intended or required for treatment of any disease or condition other than such addiction, but for self-administration over a period of several days. The question was, 'Do the acts charged in this indictment constitute an offense within the meaning of the statute?' And replying, this court said—

"'The District Judge who heard this case was of the opinion that prescriptions in the regular course of practice did not include the indiscriminate doling out of narcotics in such quantity to addicts as charged in the indictment . . . In our opinion the District Judge who heard the case was right in his conclusion and should have overruled the demurrer. Former decisions of this court have held that the purpose of the exception is to confine the distribution of these drugs to the regular and lawful course of professional practice, and that not everything called a prescription is necessarily such. [*Webb* v. *United States* and *Jin Fuey Moy* v. *United States, supra,* are cited.] . . . It may be admitted that to prescribe a single dose, or even a number of doses, may not bring a physician within the penalties of the Act; but what is here charged is that the defendant physician by means of prescriptions has enabled one, known by him to be an addict, to obtain from a pharmacist the enormous number of doses contained in 150 grains of heroin, 360 grains of morphine, and 210 grains of cocaine'—three thousand ordinary doses!

"This opinion related to definitely alleged facts and must be so understood. The enormous quantity of drugs ordered, considered in connection with the recipient's character, without explanation, seemed enough to show prohibited sales and to exclude the idea of *bona fide* professional action in the ordinary course. The opinion cannot be accepted as authority for holding that a physician, who acts *bona fide* and according to fair medical standards, may never give an addict moderate amounts of drugs for self-administration in order to relieve conditions incident to addiction. Enforcement of the tax demands no such drastic rule, and if the Act had such scope it would certainly encounter grave constitutional difficulties.

"The Narcotic Law is essentially a revenue measure and its provisions must be reasonably applied with the primary view of enforcing the special tax. We find no facts alleged in the indictment sufficient to show that petitioner had done anything falling within definite inhibitions or sufficient materially to imperil orderly collection of revenue from sales. Federal power is delegated, and its prescribed limits must not be transcended even though the end seems desirable. The unfortunate condition of the recipient certainly created no reasonable probability that she would sell or otherwise dispose of the few tablets entrusted to her; and we cannot say that by so dispensing them the doctor necessarily transcended the limits of that professional conduct with which Congress never intended to interfere.

"The judgment below must be reversed. The cause will be remanded to the District Court for further proceedings in harmony with this opinion."

The Harrison Narcotic Law and regulations have been the subject of a considerable amount of medical editorial comment. The bearing of the act upon the practice of medicine and upon the treatment of cases of chronic opium intoxication, its probable effect in decreasing or increasing the unnecessary use of the proscribed drugs, as well as the attitude and activities of administrators all have been discussed freely from practically every possible angle. While these editorial comments are of interest and value in that presumably they furnish a rough cross-section of the medical opinion of the act in question, they are too numerous to be included here. For the benefit of the reader, however, and to assist him in quickly locating this material, we are giving a partial bibliography in Appendix IX.

In 1919 a bill "to provide aid from the United States for the several states in prevention and control of drug addiction and the care and treatment of drug addicts" was introduced in Congress. This bill, however, was not passed.

The next attempt at control through national legislation is embodied in what is known as the "Narcotic Drugs Import and Export Act." After earlier efforts to pass legislation regulating the importation and exportation of narcotics had failed the bill introduced by Mr. J. F. Miller on April 11, 1921, was reported from the Committee on Ways and Means, to which it had been referred, on March 27, 1922, with amendments.[17] The report states:

> "The defects in the existing law governing the importation and exportation of narcotic drugs and the remedies therefor proposed by the committee may be summarized as follows:
>
> "(1) Restrictions on exports—The United States has, in compliance with article 7 of the International Opium Convention of 1912, prohibited the exportation of smoking opium, but as to other narcotic drugs within the scope of the opium convention, section 6 of the narcotic drugs import and export act . . . merely requires that the exportation be in accordance with the laws of the foreign country importing the narcotic drug. For more than six years after the United States adopted this narrow limitation upon exportation no regulations were issued by the Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce, as authorized by section 6, for carrying even the limitation into effect. The result has been that the exportation of narcotic drugs was permitted to countries which had not ratified the opium convention, and therefore maintained no system of control of narcotic drugs within its borders; and also to countries which had ratified the opium convention, but had failed to make and enforce effective regulation of narcotic drugs. Exportations were not limited to consignees authorized by the foreign Government to receive the narcotic drugs and the consignees who required the narcotic drugs for actual present medical or scientific uses. (See Treasury Decision, Customs No. 38033.)
>
> "In consequence it was found that large amounts of our exports of narcotic drugs, as, for instance, exports to Japan, had been reexported by the consignee (either by in-transit shipments through the country of destination or transshipment at the port of destination) to Chinese consumers, or had been smuggled

---

[17] See Appendix IV for text of Act.

back into the United States. This is due to the fact that in-transit shipments and transshipments are not deemed 'imports' subject to Japan's strict import regulations. In the case of the Chinese consumer the narcotic drug usually reached him in violation of the laws of China, aided in many instances by the postal agencies maintained by foreign powers in China. The four powers having these agencies, however, have agreed under resolution No. 5 of the Conference on the Limitation of Armament to withdraw the agencies under certain conditions. The above situation, however, has resulted in facilitating violation of our import laws and evasion of the Harrison Act, for the protection of residents of the United States; and it has also resulted in affecting China's purchasing power to the serious injury of our trade in China, and in tending to place China politically under foreign control. The injury to China's purchasing power is brought about by the consumption of narcotic drugs unlawfully brought to China, such consumption lessening the productive power of the nation and causing wasteful expenditures which compromised the profit of the Japanese and other foreign importers upon the resale of our manufacture of narcotic drugs.

"On May 1, 1920, the Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce put into effect regulations (see Treasury Decisions, Customs No. 38381) which have greatly minimized the evils just described. The policy contained in these regulations is much the same as that proposed by the committee in its amendment to section 6 of the narcotic drugs import and export act. But whatever may be said of the effectiveness of these regulations, the committee believes it highly desirable that the policy contained in them should in great measure be made a part of our permanent law, in order that it may be given a firmer legal basis and that our law, may be as broad as our obligations under the convention and wholly consistent therewith. At the hearings hereinafter referred to the Assistant Solicitor of the Department of State made this pertinent statement:

"'As the law now stands, it provides that the goods may be exported to countries regulating their entry under such regulations as are prescribed by such country for the importation thereof into said country. Where the country regulates it in any way, whether effectively or not, under this act of Congress I think the officials of the Government would be bound to permit the exportation; yet we know that some countries, while they have regulations and laws on the subject, administer them very loosely, and in order that this illicit traffic might be controlled to a greater extent it was thought that the administrative officials should have greater discretion with respect to the exportation, and if they should find that the regulations of a particular country were not being properly administered, so as to carry out the spirit of The Hague convention, they should be authorized to refuse a permit to export.'

"(II) In-transit shipments.—The United States and England are the two countries producing the greatest amount of manufactured opium and coca-leaf products. Regulation of our exports, therefore, deals with but half of the problem of preventing manufactures of narcotic drugs from reaching foreign hands which may make illegitimate use of them. England, while maintaining drastic export restrictions by licenses issued under the British dangerous drugs act, 1920 (see hearings, p. 162 ff), has, by our previous faulty legislative treatment of in-transit shipments, been unsupported by this country in enforcing the British law. The United States has thereby suffered in two ways, first, by smuggling into our domestic trade narcotic drugs contained in in-transit shipments, originating in Great Britain and destined, for the most part, to Japan; and, second, by permitting shipments in-transit through the United States to foreign countries of destination, where the drugs are diverted, as previously described, from legitimate and scientific uses and reexported to China, to the injury of ourselves and China. The committee therefore believes it very important that the present prohibition upon in-transit shipments and the transshipments of smoking opium should be coupled with a similar restriction upon other opium products, such as morphine, and upon coca leaves and its derivatives, such as cocaine.

"(III) Imports.—The existing law in section 1 of the narcotic drugs import and export act . . . prohibits the importation of smoking opium, but permits the importation for medical purposes of other opium products, and places no restraint whatever upon the importation of coca leaves and their derivatives. The United States manufactures more than a sufficient amount of narcotic drugs for domestic medical and scientific uses. The committee therefore believes it desirable to restrict our importation to raw opium and coca leaves, and to admit these only in amounts found by the Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce to be sufficient to provide our manufacturers with enough of the raw products for the domestic and scientific uses of this country, and for foreign exportation as required by the opium convention for medical and scientific uses of legitimate foreign consumers. This restriction will also aid in enforcing our export restrictions and in minimizing the injury to China and ourselves previously described. It will also aid in preventing evasions of the Harrison Act, by means of the unlawful importation into this country of narcotic drugs previously imported by us and sent into the export trade, and will close the legitimate domestic market to foreign manufacturers. By proper action in authorizing the importation of the raw products, it is believed that the three Secretaries can curb any tendency to increase the price of the manufactured narcotic drugs which might otherwise result from the prohibition of their importation, and by such action also take account of increased domestic consumption beyond the ordinary needs for medical and scientific uses, due either to diversion of drugs into illegitimate domestic channels in violation of the Harrison Act, or to epidemic or war conditions."

This bill as amended was adopted and approved on May 26, 1922.

The Federal Narcotics Control Board, created under this Act, have made the following regulations: [18]

"Pursuant to the provisions of the narcotic drugs import and export act, approved May 26, 1922, published in T. D. 39154 of June 12, 1922, the Federal Narcotics Control Board hereby prescribes the following regulations:

"Regulation 1. Definitions.—(a) The term 'crude opium' shall be understood to mean the spontaneously coagulated sap obtained from the soporific poppy

---

[18] The Narcotic Drugs Import and Export Act and the Regulations thereunder—May, 1923.

(papaver somniferum and related species), and which may or may not have been subjected to further drying or other treatment, thus covering all forms of opium known to the trade, such as gum opium, granulated opium, powdered opium, and deodorized (denarcotized) opium, except 'smoking opium' or 'opium prepared for smoking.'

"(b) By coca leaves shall be understood the leaves of Erythroxylon Coca, known commercially as 'Huamuco Coca,' or the leaves of Erthroxylon Truxillense, known commercially as 'Truxillo Coca,' or the leaves or any other species of Erythroxylon yielding cocaine.

"(c) The term 'cocaine' shall be understood to cover all forms of cocaine or its salts known to the trade.

"(d) The term 'derivative' shall be understood to mean any alkaloid, or salt of an alkaloid, or combination thereof, or any chemical compound prepared either directly or indirectly from the alkaloids of opium or from cocaine. It shall include morphine, codein, ethylmorphine hydrochloride (known as dionin), or diacetylmorphine hydrochloride (known as heroin), their salts or combinations and any new derivative of morphine or cocaine, or of any salts of morphine or cocaine, or any other alkaloids of opium.

"(e) The term 'preparation' shall mean any product, mixture, or compound containing or representing any quantity of opium or coca leaves or any derivative thereof.

"Imports.

"Regulation 2. Ports designated for imports.—Crude opium and coca leaves (which are the only 'narcotic drugs' as defined in the act that are admissible) may be imported only at the ports of Detroit, Michigan; Indianapolis, Indiana; New York, N. Y.; Philadelphia, Pennsylvania; St. Louis, Missouri; and San Francisco, California.

"Regulation 3. Who may import.—Crude opium and coca leaves may be entered only by manufacturers actually engaged in manufacturing from such crude opium or coca leaves products for the wholesale trade for medical or other legitimate uses.

"Regulation 4. Applications required.—Applications in triplicate for permission to import crude opium or coca leaves shall be made under oath on an approved form, stating all material facts, and addressed to the collector of customs at the proposed port of immigration, who, after careful consideration thereof and any investigation deemed necessary, shall forward the application with his recommendation to the Federal Narcotic Control Board, care of Division of Customs, Treasury Department, Washington, D. C. Such application must state the amount of the stock on hand, the usual requirements for the ensuing six months, and the necessity for the proposed importation.

"Upon request, the collector of customs may furnish to the applicant a certified copy of the approved application for use under the laws or regulations of the exporting country.

"Regulation 5. Procedure on arrival and delivery from the appraiser's warehouse.—Immediately upon the unlading of crude opium from the importing vessel, the customs officer shall carefully examine the packages, note their condition, seal the packages, and cause them to be transported under customs guard and by bonded cartmen to the appraiser's warehouse where they shall be placed in a separate and specially protected inclosure.

"The appraiser shall issue such special regulations to his employees as will insure the safekeeping of the packages while in the warehouse.

"No delivery of crude opium to the importer from the appraiser's warehouse shall be permitted until the deputy collector of customs in charge of the building and an assistant appraiser shall be satisfied and so note on the delivery permit after personal examination that the importer has taken all proper precautions for the safe transportation of the crude opium from the appraiser's warehouse to the importer's premises or to the premises of the common carrier if shipment is to be made.

"Until otherwise ordered, however, the procedure now followed in the case of shipments of crude opium in bond between the ports designated in regulation 2 for imports will not be disturbed.

"Except as specially provided in these regulations, the procedure in the case of coca leaves shall be the same as in the case of merchandise generally.

"Regulation 6. Entries.—Crude opium may be entered only for consumption or for transportation in bond between the ports designated in regulation 2 for imports. Entry of either crude opium or coca leaves shall not be permitted unless the application to import has been approved by the Federal Narcotics Control Board nor unless the merchandise has been properly described in the manifest of the importing vessel or carrier.

"Coca leaves, however, may be entered either for consumption or warehouse, or for transportation in bond to any of the ports designated in regulation 2.

"Regulation 7. Importations of unusual amounts.—No amount of crude opium or coca leaves which may be imported within any certain period as necessary to provide for medical and legitimate uses only will be fixed by the board at present, but special explanation of importations of unusual amounts of such articles either in single shipments or in the aggregate will be required and carefully investigated by the board.

"Regulation 8. Reports of stocks on hand and probable future requirements. —Importers shall render to the board, as soon as practicable after December 31 of each year, or oftener if especially required, a report of the stocks of narcotic drugs on hand and an estimate of the probable requirements for medical and legitimate uses for the next year or any other period that may hereafter be specially designated.

"Exports.

"Regulation 9. No exportation without previous approval.—No persons shall take out of the United States on his person or in his baggage or offer to any carrier for transportation out of the United States, nor shall any carrier receive for exportation or export out of the United States any narcotic drug unless and until an application for permission to export shall have been approved by the Federal Narcotics Control Board.

"Regulation 10. Applications.—Applications in triplicate for permission to export narcotic drugs shall be made under oath on an approved form, stating all the material facts, and addressed to the nearest collector of customs sufficiently early to permit of orderly procedure and any necessary investigation. With this application, the shipper's export declaration in due form shall also be submitted, together with any import license (and a translation thereof if in a foreign language) or a certified copy of any such license, that may have been issued by the country of destination, or other evidence that the merchandise is consigned to an authorized permittee.

"Verification by an American consular officer of signatures on foreign import licenses will not be necessary if such licenses bear the official seal of the officer signing them.

"After careful consideration of such application, and after any investigation deemed necessary, the collector shall forward the application to the board with his recommendation.

"Regulation 11. Labeling of packages.—In lieu of the marking on the outside of the packages required in the previous regulations (T. D. 38381), the inner packages shall be labeled in a legible and conspicuous manner to show the narcotic character of the contents.

"Regulation 12. Opening and inspection of package.—The collector of customs may require packages offered for export to be opened and may inspect the contents thereof.

"In-Transit Shipments.

"Regulation 13. In-transit shipments transferred in the United States or remaining on board the transporting vessel.—Each in-transit shipment under section 2 (subsec. 5) of the act, will be considered by the board on its individual merits, but in general the regulations governing exports will be applied so far as practicable, except that the collector of customs may permit narcotic drugs, other than smoking opium or opium prepared for smoking, to be retained on board a vessel arriving from a foreign port which are shown on the manifest to be destined to another foreign port.

"Articles in transit manifested merely as drugs, medicines, or chemicals, without evidence to satisfy the collector that they are non-narcotic, shall be detained and subjected at the carrier's risk and expense to such examination as may be necessary to satisfy the collector whether they are of narcotic character. With a view to avoiding such inconvenience, the carrier should not accept in-transit shipments of such articles unless accompanied by properly verified certificates of the shippers, specifying the items in the shipment and stating whether narcotic or not.

"General.

"Regulation 14. Importations or exportations by mail prohibited.—The importation or exportation of narcotic drugs in the regular mails or by parcel post will not be permitted.

"Regulation 15. Vessels' stores.—Collectors may permit narcotic drugs in reasonable quantity and properly listed as medical stores of vessels to remain on such vessels if satisfied that such drugs are adequately safeguarded and used only for medical purposes. Smoking opium or opium prepared for smoking shall be seized, however, whenever and wherever found.

"Regulation 16. Custody and disposition of narcotic drugs forfeited or not claimed.—All narcotic drugs which are forfeited in proceedings for condemnation, or not claimed as provided by law, or which are summarily forfeited as provided in subdivision (d), subsection 2, section 1, of the act, shall be reported to the secretary of the board on a form provided by the Treasury Department for that purpose, and retained by the officer reporting the same as custodian for the board pending their disposition. Two committees, each consisting of three employees of the Treasury Department, shall be appointed by the secretary of the board, the duties of each of which shall be to examine, weigh, inventory and destroy such drugs as he may direct. Each committee shall make report to the secretary of the board of all such drugs destroyed immediately upon completing such destruction.

"Regulation 17. Violations of the law to be reported.—Collectors of customs shall report to the United States attorney and to the board any violations of the law which they may discover.

"Regulation 18. Compliance with other laws and regulations applicable is necessary.—All regulations of or action by the board is subject to the provisions of the customs, internal revenue, and other laws and regulations applicable.

"Regulation 19. Emergency regulations superseded.—These regulations supersede the emergency regulations published in T. D. 39154 of June 12, 1922.

"Regulation 20.—Previous licenses valid.—Authorizations to import or export issued prior to the taking effect hereof by the Division of Customs, Treasury Department, under the provisions of the regulations published in T. D. 39154 of June 12, 1922, will continue valid.

"Regulation 21. Secretary and assistant secretary of the board.—Under date of March 10, 1923, the board designated Col. L. G. Nutt, Head of the Narcotic Division, Bureau of Internal Revenue, Treasury Department, as its secretary, with authority to act upon applications and conduct correspondence for and on behalf of the board. Mr. M. R. Livingston, Chief of the Returns Section of said division, is hereby designated as assistant secretary of the board to perform such duties in connection therewith as the secretary of the board may direct.

"Regulation 22. Time of taking effect.—These regulations shall take effect October 15, 1922."

An amendment to the act above referred to was passed by Congress and approved June 7, 1924. This amendment reads as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That subsection (b) of section 2 of the Act of February 9, 1909, as amended by the Acts of January 14, 1914, and May 26, 1922, entitled 'The Narcotic Drugs Import and Export Act,' be further amended by the addition of the following sentence:

'Provided, That no crude opium may be imported for the purpose of manufacturing heroin.' "

In connection with limiting the amount of opium imports to the so-called "medical needs" of the country, Lambert after referring to the statement often quoted that 90% of the amount of these drugs imported is used for other than medical purposes, gives the following method for determining the amount needed "in the legitimate practice of medicine:" [19]

"Since the Harrison law requires a record to be kept in each hospital of the amount of opium and its alkaloids purchased and the amount consumed, it would seem possible, by calculating from the number of patients treated in the hospitals and the amount consumed, to obtain a fairly accurate idea of the amount of opium and its alkaloids used in the legitimate practice of medicine. From previous investigations it is known that from 2 to 2.25 per cent of the population are sick in the year, and that from 18 to 23 per cent of these patients are sufficiently ill to be in the hospital. On the basis, therefore, of 23 per cent of 0.0225 per cent, that is, that 0.005175 per cent of the population are hospital patients, one obtains an approximation of the amount of opiates used in the practice of medicine. If, therefore, without taking any account of the illness or the injury which brought the patient to the hospital, without discussing the therapeutics, and scattering the hospitals over a sufficient area in the United States to prevent local peculiarities from coming in, it would seem that a fair estimate can be obtained. This has been done, and the statistics here presented are from the records of hospitals for the years 1920 and 1921, and these hospitals are scattered from New England to the Pacific coast; from the populous Middle Atlantic states; from the Northwest and Great Lakes down the Mississippi Valley to the Gulf and the border of Mexico, and along the Rocky Mountain states to complete the area covered. They are from hospitals dealing with general medicine and surgery; special hospitals devoted to the care of children and maternity cases; industrial hospitals of large industries, and hospitals caring for cancer cases, in which the use of the opiate is a necessity in large amounts; so that they comprise hospitals using a minimal amount of opiates, hospitals using a maximal amount, and large hospitals in general medicine and surgery using average amounts.

"TABLE 2.—HOSPITAL PATIENTS

	No. of patients	Grains of morphin	Grains of heroin	Grains of opium	Grains of codein
1920............	412,196	148,448.22	11,708.12	109,073.76	176,438.80
Amount per patient	....	0.3600	0.0281	0.2646	0.4280
1921............	442,921	140,603.18	8,730.48	173,169.36	220,262.64
Amount per patient	....	0.3174	0.0197	0.3909	0.4995
Totals...........	855,117	289,052.40	20,438.6	282,143.12	396,701.44
Amount per patient	....	0.3387	0.0239	0.3277	0.4637

---

[19] Lambert, Alexander—The Amount of Opiates Used in the Legitimate Practice of Medicine. J. A. M. A. May 20, 1922. Vol. 78. No. 20.

“The intention, at the beginning, was to calculate only from hospital patients; but the statistics of some of the hospitals have made it impossible to separate hospital bed patients from the ambulatory dispensary patients. This seemed, at first appearance, a disadvantage; but on second thought it proved the reverse, as it gives the difference between the amounts used among all patients and the amounts used solely for bed patients. There is an interesting difference between the two in that the amounts of morphin, codein and heroin are less among the dispensary patients, but the amount of opium is more per patient. This agrees with the rational therapeutics that one would expect to find for the morbid conditions usually presented.

“In Tables 2 and 3 the variation between the two years is averaged up in the total. We see, therefore, that in caring for the hospital patients there is prescribed during the year an amount equivalent to giving each patient 1/3 grain of morphin, 1/42 grain of heroin, 1/3 grain of gum opium, and practically 1/2 grain of codein.

“TABLE 3.—HOSPITAL AND DISPENSARY PATIENTS

	No. of patients	Grains of morphin	Grains of heroin	Grains of opium	Grains of codein
1920............	780,428	80,372.175	5,350.84	367,419.545	228,799.215
Amount per patient	....	0.1030	0.0068	0.4607	0.2932
1921............	920,494	115,372.03	5,129.46	383,601.257	295,288.91
Amount per patient	....	0.1253	0.0056	0.4167	0.3208
Totals...........	1,720,922	195,744.205	10,480.30	751,021.302	524,088.125
Amount per patient	....	0.1137	0.0061	0.4365	0.3045

“In hospital and dispensary patients, we find necessary an amount equivalent to giving each patient about 1/9 grain of morphin, 1/164 grain of heroin, 1/2 grain of gum opium, and practically 1/3 grain of codein.

“To obtain the amount of opium necessary to be imported into this country, we must translate these terms of alkaloids into terms of gum opium, and we must therefore consider for a moment the chemistry of their preparation. In every 100 parts of opium, the U. S. Dispensatory states, there are 10 parts of morphin and 3/10 of a part of codein. Cushing gives 5/10 of a part of codein. We will use the 3/10, as it will produce a larger total, and we shall thus obtain an amply sufficient supply. The amount of opium required is therefore governed by the amount necessary to obtain the amount of codein used. Codein, moreover, is obtained from the mother liquor of opium after the morphin is crystalized out. If we, therefore, have enough opium to give us the codein, we shall have an excess of morphin. Heroin is diacetylmorphin, and is made by treating morphin with acetyl chlorid. Dionin, on the other hand, is ethylmorphin, and is made by the action of ethyl iodid in the presence of an alkali on morphin. The necessary amounts of dionin and heroin, therefore, are easily obtainable from the excess of morphin which remains after the demands in medicine are satisfied, since, as we have said, the opium used to obtain the codein contains thirty-three and one-third times as much morphin as codein.

"In calculating, therefore, the amount of opium required on the basis of the amount of codein desired, we are amply providing for the alkaloids here mentioned and usually employed in the medical practice.

"Among the hospital patients, taking 0.4637 grain as the necessary amount of codein for each patient yearly, it must be equivalent to 0.3 per cent of the total amount of opium required for each patient yearly, since gum opium contains 3/10 part of codein per hundred parts of opium. Each patient, therefore, will require 154.56 grains of opium yearly to make the necessary amount of codein. By adding to this 0.3277 of gum opium required as opium, we have 154.88 grains. If we add the maximal amount of opium as calculated for the dispensary patients of 0.4384 we get 154.99 grains. In either case it is practically 155 grains of opium that is necessary to produce the amount of codein plus the amount of gum opium necessary to obtain both gum opium and its alkaloids of codein, morphin, and the synthetic heroin and dionin. One hundred fifty-five grains of opium will give 15.5 grains of morphin; and as each patient in the hospitals requires, according to our calculations, only 0.3387 grain yearly, there will each year remain an excessive amount of morphin.

"Two and twenty-five hundredths per cent of all the population are sick in this country each year. At present, the population of the United States is given as being 106,000,000. Two and twenty-five hundredths per cent of this number is 2,385,000. Multiplying this by the 155 grains for each patient and dividing the result by the 413 grains in an avoirdupois ounce, and again dividing that quotient by 16 ounces, we obtain 55,943½ pounds of opium. Opium is distributed medically in Troy ounces of 480 grains to the ounce and 12 ounces to the pound, but is bought in avoirdupois ounces of 413 grains to the ounce and 16 ounces to the pound. This is calculating on the basis of every one being as sick as the hospital patients. Taking, however, the amount required by the hospital and dispensary patients combined, which perhaps is a fairer estimate, we find that the amount of codein required is 0.3045 grain; and, adding the amount required of gum opium in the dispensary, 0.4365 grain for each patient, we have 101.9 grains for each person required to give the desired amount. Multiplying, therefore, the 2,385,000 patients by 102 grains, we find that 37,117 pounds will be required.

"Thus, it is seen that the amount of opium required in the practice of medicine depends on whether we calculate by the amount of codein used only among hospital patients, or whether we calculate by the amount of codein required in hospital and dispensary patients together. Somewhere between 37,500 and 56,000 pounds is probably nearer the truth. Calculating from the 77 per cent dispensary patients and 23 per cent hospital patients combined, we have 23 per cent of 2,385,000, or 545,550 patients as hospital patients, requiring yearly, at 155 grains for each patient, 12,796 pounds of opium, and 1,839,451 patients as dispensary patients requiring, at 102 grains each, 28,393 pounds of opium, or a total of 41,189. To assure an ample amount of even an increased demand of codein, 45,000 pounds of opium may well be considered an abundant amount of opium to be imported each year for medicinal use. This is less than one-tenth the actual amount now imported, and supports the statement of the Treasury Report on Traffic in Narcotic Drugs that 90 per cent of the amounts of these drugs entered for consumption is used for other than medical purposes.

"These figures do not include the practice of dentistry and veterinary medicine; but the excess of morphin obtained in making the codein beyond that required in the practice of physicians will be more than ample to supply the legitimate needs of the dentists and veterinary surgeons."

Early in his article, Lambert states that:

"Since the Harrison law requires a record to be kept in each hospital of the amount of opium and its alkaloids purchased and the amount consumed, it would seem possible, by calculating from the number of patients treated in the hospitals and the amount consumed, to obtain a fairly accurate idea of the amount of opium and its alkaloids used in the legitimate practice of medicine."

This paragraph contains a statement which forms the basis for his estimate for all needs of the "legitimate practice of medicine" and which may be questioned. The writer indicates that the use of opium in hospitals is indicative of the use of opium in the "legitimate practice of medicine" generally. It is well-known that well-equipped hospitals contain many facilities for avoiding the use of opium both for the relief of pain and for other therapeutic objects. The close supervision of hospital patients, the constant presence of resident physicians, the care afforded by a competent nursing staff, appliances for hydro- and thermo-therapeutic, electrical, and various mechanical appliances, to say nothing of the influence of constant education of the patients, all tend to lessen the need for opiate administration. In private practice, however, where hospital equipment is not at hand, the physician must depend usually upon untrained members of the family to care for the patient. Further, in small towns and rural districts where the attending physician because of the many demands upon his time may not be constantly within call when advice is needed, where his visits, indeed, may be limited to one, two or three times a week, it is obvious that the need for opium and opium preparations is far greater. Individuals suffering from painful conditions requiring relief or from other conditions where the therapeutic indication is for the use of opium are just as much entitled to assistance as are those fortunate enough to be able to avail themselves of hospital facilities. Without the equipment mentioned above, however, the relief of pain is far more difficult under conditions of private practice unless some preparation of opium may be used. Unfortunately there are no figures available for purposes of comparison but it is extremely doubtful if the above statements will be contested by those familiar with the conditions met in hospital and private practice.

The writer further states that the statistics as to opium use presented are from hospitals dealing with "general medicine and surgery; special hospitals devoted to the care of children and maternity cases; industrial hospitals of large industries, and hospitals caring for cancer cases, in which the use of the opiate is a necessity in large amounts; so that they comprise hospitals using a minimal amount of opiates, hospitals using a maximal amount and large hospitals in general medicine and surgery using average amounts."

That the types of hospitals mentioned by Lambert actually represent the maximal use of opium obtaining in the hospital practice is open to question. There is no mention made in the above enumeration of hospitals caring for cases of tuberculosis where, in the terminal stages at least, it is not uncommon to employ very considerable amounts of opium. Again no mention is made by the author of institutions, either public or private, where cases suffering from chronic opium intoxication are treated. Here probably will be found the greatest therapeutic use of opium of all. As an example might be taken the use of opium in treating cases of addiction according to the method described by Lambert. From his description it will be noted that three or four doses of morphin are employed in treating these cases. The first dose should be, according to the author, two-thirds or three-fourths of the total daily twenty-four-hour dose, the larger amount being better if the patient can take it. The second dose should be one-half of the first dose and the third dose allowed one-half of the second dose. As nearly as can be determined, a fourth dose, one-half of the third dose, is given in about one-half of the cases.

In addition to the morphin used the author recommends in the latter portion of the treatment the use of codein in from one to five grain doses "as may be necessary to quiet him." The total number of doses of codein is not given but left to the discretion of the attending physician. It would appear, however, that two doses of codein would not be an excessive number in the average case.

In order to form some idea of the amount of opium needed in the treatment of a case by this method, it is necessary to assume an average daily dose in cases of chronic opium intoxication. We are aware that there is no accurate information available on this point for reasons stated in a previous chapter. We shall assume arbitrarily, therefore, ten grains to be an average daily consumption. From a figure obtained on this basis the reader easily can calculate the amount of opium that would be required should he deem the average dose either excessive or insufficient.

On this basis of ten grains the amount of morphin required for the first three doses per patient would be 13.125 grains and for the fourth dose given in one-half the cases treated, .4268. This totals 13.59 grains. Assuming that the average dose of codein is 2½ grains and that two doses are required in the average case we find that five grains would be used.

Lambert states that "in every 100 parts of opium, the U. S. Dispensatory states, there are 10 parts of morphin and 3/10 of a part of codein." Using these percentages and calculating the amount of opium required to produce the morphin and codein needed to treat one patient, we find that

13.593 grains of morphin require 135.93 grains of gum opium
5 " " codein " 1666.6 " " " "

The number of chronic users of opium in the United States is as we have stated unknown. Lambert in other connections, however, quotes from the report of the Special Committee on Investigation appointed by the Secretary of the Treasury in 1918 so that it might be well to use the figure given in this report as a basis for determining the amount of crude opium required to treat each patient once according to the method. This figure is one million. Multiplying by one million 135.93 grains of opium and converting the resulting figure into avoirdupois pounds by dividing first by 413 and again dividing the quotient by 16, we get 20,566 pounds. To secure the 5 grains of codein needed for treatment we should multiply 1666.6 by a million. Again converting into pounds, we find that to produce this amount of codein 252,194.3 pounds of gum opium would be required. For the purposes of this discussion we may omit consideration of the crude opium needed for the production of the required amount of morphin inasmuch as a quite sufficient amount would be secured as a by-product of the codein production if as Dr. Lambert states, codein is obtained "from the mother-liquor of opium after the morphin is crystallized out."

As a matter of fact, however, Lambert is mistaken in his assumption that all codein is obtained "from the mother-liquor of opium after the morphin is crystallized out" and that therefore the opium requirements should be calculated on the basis of the amount of the crude drug needed to yield the codein requirements. While it is true that codein may be obtained in this way, it is done so only to the extent of its content in the opium available for all other purposes and the balance of the codein needed is obtained by methylating morphin. Thus the codein requirements influence the total amount of opium needed for all purposes only to the extent of the amount of the crude drug needed for the production of morphin to make the codein not provided in the crude drug available for other purposes.

Be this as it may, if we assume that every case of chronic opium intoxication is entitled to at least one course of treatment, if we further assume that this course of treatment will be successful in 100 per cent of cases and if we still further assume that no new cases will be formed, we find that Lambert's treatment of existing users once requires about five times the amount of opium indicated by him as sufficient for the legitimate therapeutic needs of the country for one year. This amount of opium, however, requires that the million hypothetical patients all be treated at one time or that those awaiting treatment be denied their customary drug until their turns arrive. Any contemplation of the amount of opium required to supply these cases awaiting their turn at the Lambert treatment, leads us into such enormous quantities that we consider it useless to pursue the speculation further. Whether or not the treatment of cases of chronic opium intoxication by this or any one of several other methods constitutes "legitimate practice of medicine" within the meaning of Lambert's article we may not say, as he omits any mention of the opiate needs in the treatment of these cases.

We have given this example of Lambert's method of arriving at the legitimate opium needs of this country in order to point out the manifold difficulties of making such estimates upon such bases as are at present available. The very grave results that might follow arbitrary assumptions are only too apparent as are likewise the dangers of over-estimates. In other words, it would appear that here again we are confronted with such inadequate knowledge as to indicate the importance of far more comprehensive studies of the situation than have yet been made.

It might seem at first sight a comparatively easy matter to determine the so-called "legitimate medical needs" for narcotic drugs.

Years ago it was stated first, we believe, by Dr. Hamilton Wright that 10% of the opium and opium products imported into the United States would serve the therapeutic needs of the country and that 90% was used for other purposes. This statement has been quoted and requoted for the last fifteen or twenty years and has come to be accepted by many as authoritative. Certainly it was not based originally upon any comprehensive survey of the country's opium needs as no such survey has ever been made. Whether or not it was based even on local figures is not known but we feel it safe to assume that the statement is erroneous or at the most purely speculative.

To determine accurately the country's medical needs of opium would require an exhaustive study of the actual therapeutic uses to which opium is put under all of the existing conditions. Such a study would take into account variations in medical practice, in disease prevalence, in race composition, occupation, and many other factors which it is unnecessary to mention here.

In the actual compilation of such data accurate methods of determination should be employed and to avoid error they should cover the ultimate consumption of the drug. Therefore, from a practical point of view the nearest approach would be a study of the records of physicians, dentists, veterinarians, scientists and retail pharmacists—the ultimate distributors of the drug.

Although it is obvious that such a study could not be made for the country as a whole, however, it apparently would be possible to arrive at a fairly satisfactory figure through studies made in properly selected localities which together might be taken as representative.

Two studies of this nature were made during 1924. A. G. DuMez of the United States Public Health Service determined the use of narcotics in Allegany County, Maryland for the period July 1, 1922 to June 30, 1923,[20] and the Committee on Drug Addictions studied the use of opium and coca leaves in six communities during the period July 1, 1923 to June 30, 1924.[21]

---

[20] DuMez, A. G.—Per Capita Medicinal Requirements of Narcotics. Data Secured in a Narcotic Survey of Allegany County, Maryland. Public Health Reports. Vol. 39. No. 37. September 12, 1924.

[21] Committee on Drug Addictions, New York. Preliminary Report on Studies of the Use of Narcotics under the Provisions of Federal Law in Six Communities in the United States of America for the Period July 1, 1923, to June 30, 1924. New York. November, 1924.

With regard to the selection of Allegany County, the procedure followed, and his findings DuMez states:

"Allegany County, Md., was selected for this purpose for several reasons, namely, (1) because of its remoteness from the sea coast and boundary lines, where the greater possibility of obtaining narcotics might tend to vitiate the results; (2) because the county is fairly distant from and contains no large cities in which it is thought that abnormal conditions are more likely to prevail; (3) because the occupations of its inhabitants are quite diversified—farming, mining, railroading, and manufacturing being represented; (4) because the county is easily accessible from Washington. In other words, it was thought that Allegany County represents as nearly as possible a normal unit within easy reach of Washington where conditions prevail which can be taken as typical of the country as a whole.

"The actual work of the survey consisted in visiting all the narcotic registrants in the county and compiling from their records the amounts of narcotics dispensed or used during the period of one year. In all there were visited 69 physicians, 12 dentists, 20 retailers (pharmacists), 3 wholesalers (pharmacists), 1 veterinarian, and 5 hospitals and sanitoria. The records of each were examined in detail. These records showed that for the period July 1, 1922, to June 30, 1923, the following quantities of narcotics were dispensed or used:

"Table 1.—Total quantities of opiates dispensed or used.

	Grains.
Opium	38,937
Codeine sulphate and phosphate	29,410
Morphine sulphate and hydrochloride	22,284
Ethylmorphine hydrochloride (dionin)	4,724
Diacetylmorphine hydrochloride (heroin)	1,940
Cotarnine hydrochloride (stypticin)	788
Apomorphine hydrochloride	93
	Fl. oz.
Exempt preparations (paregoric, Bateman's drops, Godfrey's cordial, etc.)	10,366

Total cocaine dispensed or used.

	Grains
Cocaine hydrochloride	11,485

"The equivalents of the foregoing quantities in terms of crude drugs are given in Table 2. In computing these equivalents the amount of anhydrous morphine present in opium has been taken as 10 per cent, of anhydrous codeine as 0.3 per cent, and of narcotine as 5 per cent. In computing the opium equivalent of the total quantity of opiates 855 grains of codeine sulphate have been subtracted from the 29,410 grains of codeine sulphate and phosphate, as this quantity can be extracted (on the 0.3 per cent basis) from the opium required to manufacture the stated quantities of morphine sulphate and hydrochloride, ethylmorphine hydrochloride, diacetylmorphine hydrochloride, and apomorphine hydrochloride. Likewise, the 788 grains of cotarnine hydrochloride have been omitted, as the quantity of narcotine which can be extracted from the opium required to manufacture the foregoing alkaloids and their derivatives is more than sufficient (on the 5 per cent basis) to yield this amount. In computing the coca leaf equivalent of the quantity of cocaine hydrochloride used, the yield of anhydrous cocaine has been taken as 0.5 per cent.

"Table 2.—Opium equivalents of opiates.

		Grains of opium
38,937 grains of opium	=	38,937
28,555 grains (29,410-855) codeine sulphate	=	213,219
22,284 grains morphine sulphate	=	167,130
4,724 grains ethylmorphine hydrochloride	=	36,560
1,940 grains diacetylmorphine hydrochloride	=	13,060
93 grains apomorphine hydrochloride	=	850
10,366 fluid ounces exempt preparation	=	18,906
Total		488,662
	=	69.81 pounds

Coca leaf equivalent of cocaine

		Grains of coca leaves
11,485 grains of cocaine hydrochloride	=	2,051,220
	=	293.03 pounds

"The per capita consumption of opium for Allegany County on the basis of a population of 69,938 as found for 1920 by the Bureau of the Census, United States Department of Commerce, would therefore be 6.98 grains. In the case of coca leaves, it would be 29.32 grains. To supply the entire United States on this basis, taking the population to be 106,000,000, would require the annual importation of approximately 105,697 pounds of opium and 443,988 pounds of coca leaves."

DuMez comments on his findings and on local conditions as follows:

"It is thought that the quantities of narcotics dispensed or used in this country represent fairly accurately the medicinal requirements at present, except in the case of cocaine and the exempt preparations. A census taken for the year July 1, 1923, to June 30, 1924, would no doubt show a much smaller quantity of cocaine used, as most of the dentists who used cocaine in 1922 to 1923 reported that they had since discontinued its use in favor of the synthetic local anesthetics. In the case of exempt preparations (paregoric), it is thought that, although they were sold only in small amounts (in quantities not exceeding 2 fluid ounces), they were dispensed too frequently in some cases to the same individuals. It is also realized that some of the residents of the county may have purchased narcotics outside of the county (in near-by counties for instance); but it is thought that any error in the total amounts resulting from this cause would be counterbalanced by that introduced through the purchases made within the county by non-residents."

The studies made by the Committee on Drug Addictions are described as follows:

"The Committee undertook these studies in addition to its other work to make available for use by the international conference called on invitation by the League of Nations certain data which might prove valuable as a basis of fact for any estimates made in a consideration of the limitation of the production of the drugs concerned.

"Method.—Obviously it was impossible to obtain an exact figure representing the amount of opium and coca leaves and their derivatives and preparations legally used throughout the country as a whole. The Committee decided, therefore, that the most that could be undertaken in the way of intensive studies would be comprised in a review of the legal uses of these drugs in certain selected areas. Six communities representing as nearly as possible all factors contributing to a varying use of these drugs were selected for these studies.

"It was decided that racial characteristics, occupations, geographic location, disease incidence, and other influences should be considered and that as a basis for selection the ratio of these factors in the aggregate should be typical of the country as a whole. In this connection, attention was paid also to the admixture of urban and rural population in order that the presence or absence of medical, institutional and sanitary equipment might be represented fairly.

"The determination of the amounts of narcotic drugs used in the communties studied depended upon a complete inspection of certain records required to be kept by the federal narcotic act known as the Harrison Narcotic Law. The communities selected and their populations are indicated in the appropriate tables.

"It is not necessary to review all of the provisions relating to record-keeping outlined in the federal law in this country but only such as relate to the end distributors of the proscribed drugs. Physicians, dentists, veterinarians and hospitals are required to register and may secure these drugs only upon duplicate order forms for personal administration or dispensing. One copy of each form is sent to the dealer from whom the supplies are purchased. The other is retained by the registrant. In addition each registrant under this class is required to prepare as of July 1 of each year an inventory of stock on hand. It is possible, therefore, to secure from the records of the inventories and those of purchases upon the required order forms exact information as to the amounts of opium and coca leaves and their preparations used by each registrant during a given twelve-month period. The registration of physicians, dentists, and veterinarians also includes permission to prescribe these drugs upon certain forms. Retail pharmacists under the provisions of the law may register in another class and fill such prescriptions provided that the original prescriptions be kept on file for a period of not less than two years. In addition through their registration they may dispense without a prescription certain exempt preparations described in section six of the law, provided that a record be kept of all such sales. This section defines 'exempt' as follows:

> Preparations which do not contain more than two grains of opium or more than one-fourth of a grain of morphine, or more than one-eighth of a grain of heroin, or more than one grain of codein, or any salt or derivative of any of them in one fluid ounce, or, if a solid or semisolid preparation, in one avoirdupois ounce; or liniments, ointments, or other preparations which are prepared for external use only, except liniments, ointments, and other preparations which contain cocaine or any of its salts or alpha or beta eucaine or any of their salts or any synthetic substitute for them.

"From the records above described it is possible to determine the amounts of these drugs actually delivered to the consumer in any given territory. In the communities studied it was necessary personally to consult each record required to be kept by retail distributors of the drug in question—registrants under the Harrison Narcotic Law.

"The number of registrants of the different classes distributing narcotic drugs to the ultimate consumer in the six communities studied are shown in Table I.

"Table I. Registrants Distributing Opium and Coca Leaves.

Class of registrants	Sioux City, Ia.	Montgomery, Ala.	Tacoma, Wash.	Gary, Ind.	Elmira, N. Y.	El Paso, Texas	Totals
Physicians, dentists, veterinarians and other practitioners	113	59	134	57	68	81	512
Hospitals	6	3	15	4	7	8	43
Pharmacists	55	24	54	34	21	58	246
Other retailers	...	14	1	..	..	..	15

* * * * *

"The actual work of the field studies consisted in tabulating in detail all amounts of opium and coca leaves and their derivatives and preparations distributed as follows:

1. By physicians, dentists, veterinarians, institutions, and laboratories.
    a. Non-exempt drugs bought for dispensing or administering. Secured from duplicate order forms kept by physicians, etc. Balance on hand at beginning and end of period noted.
    b. Exempt drugs administered and dispensed.
2. By druggists.
    a. Non-exempt drugs sold on prescriptions.
    b. Exempt preparations sold to others than physicians, dentists, veterinarians, institutions, laboratories or other dealers.
3. By other retailers.
    a. See b, under 2.

"Conclusions.— . . . It will be noted that the conversions of the alkaloids, salts and other derivatives into terms of opium and coca leaves have been made on two bases. One of these depends on the molecular relationships involved, the other takes into consideration destruction and other losses in the manufacture of these preparations. The amounts of the crude drugs which are required on the molecular basis are indicated in the column entitled 'Theoretical Basis' and those required in general manufacturing practice are indicated in the column entitled 'Practical Basis.' These two figures are given for purposes of comparison. As far as the alkaloids are concerned, both methods of calculation have been made on the basis of 10% morphin, 0.3% codein and 5% narcotin present in opium and 0.5% cocain present in coca leaves. The amount of codein present in the amount of opium necessary for all other purposes has been subtracted from the total codein needs and the amount of opium necessary to manufacture the balance from morphin as indicated has been added to the total amount of opium. The amount of opium necessary for all other purposes is sufficient to provide for the needs of the less important alkaloids.

"Supplementary Institutional Use.—It was realized that no one community could be typical of the country as a whole in hospital use of narcotic drugs by reason of the unequal distribution of these institutions of different types throughout the country. Therefore the hospital use in the communities studied was disregarded and what may be termed a 'normal' hospital use was obtained by further studies. We queried all hospitals and allied institutions, and the hospital per capita consumption for the country as a whole was determined and applied to the several communities.

"We also queried scientific research institutions such as experimental laboratories both private and commercial. The reports from these laboratories were not satisfactory inasmuch as the percentage of replies was too small for purposes of general application.

"Comments.

"1. Whatever the danger of generalizing from insufficient data, the paucity of numerical facts upon which to base an estimate of the country's needs in these drugs is so great as to render desirable almost any rational effort to secure them. It should be appreciated, however, that studies involving many times the population covered by the Committee's investigation might have elicited additional important facts and might have exposed for review and consideration conditions and factors not included in the six studies with which this preliminary report is concerned.

"A consideration of the findings in the individual communities studied, the difference in per capita consumption of the same preparations and the employment in each of certain preparations not included in the others, all make for the desirability of further investigations of this nature and point to the entrance of inevitable error into the findings observed from any too small group of data.

"2. It should further be borne in mind that the yearly need of opium and coca leaves and their derivatives may quite conceivably vary. Unusual conditions of disease incidence, wars, uprisings and other catastrophes may require without warning large additional supplies.

"3. It should also be noted that theft and wastage affect the amounts of these drugs required and in view of their irreplaceable nature in general and special medical practice these factors should be given due consideration.

"4. The requirements for scientific research are also factors of importance as affecting the amounts of these drugs to be provided.

"5. A further consideration is the effect of the recent prohibition of the manufacture of diacetylmorphin and its salts on the future requirements of opium. In view of this action there will be presumably an increased use of substitutes such as codein and morphin and the manufacture of these substitutes, because of the relatively larger doses employed to obtain the same therapeutic effect, will require a greater importation of opium than was needed for the diacetylmorphin.

"6. Use as employed in this study is necessarily restricted to use under the provisions of existing federal law. Whether that law adequately covers all legitimate needs in connection with the use of these drugs, this report does not presume to determine."

Tables Nos. XIII and XIV show the findings in the communities where studies were made, the per capita for these communities, and the amounts of opium and coca leaves resulting from the application of each per capita to continental United States.

TABLE XIII

TOTAL NARCOTIC USE IN SIX COMMUNITIES

Cities and adjacent districts	Population *	Physicians		Drug stores		Hospitals†		Totals	
		In terms of crude drug		In terms of crude drug		In terms of crude drug		In terms of crude drug	
		Theoretical basis	Practical basis	Theoretical basis	Practical basis	Theoretical basis	Practical basis	Theoretical basis	Practical basis
		grains	*grains*	*grains*	*grains*	*grains*	*grains*	*grains*	*grains*
Sioux City, Ia. . .	106,023	81,330	84,132	308,958	337,701	41,444	45,346	431,733	467,180
Montgomery, Ala.	80,853	76,037	76,745	966,109	1,019,447	31,605	34,580	1,073,752	1,130,774
Tacoma, Wash. . .	152,531	51,653	53,229	482,667	517,124	59,624	65,237	593,945	635,592
Gary, Ind.	82,566	37,167	43,198	210,313	230,596	32,275	35,313	279,755	309,108
Elmira, N.Y.	69,913	150.451	152,491	781,558	806,374	27,328	29,901	959,338	988,768
El Paso, Teaxs. . .	120,191	23,874	29,955	473,066	519,832	46,982	51,405	548,923	601,194
Sioux City, Ia. . .	106,023	2,933,265	2,933,972	1,026,192	1,026,447	349,706	349,759	4,309,164	4,310,179
Montgomery, Ala.	80,853	434,015	434,124	969,931	970,167	266,685	266,725	1,670,632	1,671,017
Tacoma, Wash. . .	152,531	3,199,409	3,199,956	740,855	740,984	503,108	503,184	4,443,372	4,444,125
Gary, Ind.	82,566	261,952	262,020	394,949	394,993	272,335	272,376	929,237	929,391
Elmira, N.Y.	69,913	1,465,223	1,465,589	116,818	116,831	230,601	230,635	1,812,642	1,813,056
El Paso, Texas. . .	120,191	139,477	139,490	525,719	525,852	396,437	396,498	1,061,635	1,061,841

*Population based on intercensal estimates of the U. S. Bureau of the Census.

†Figures in this column were obtained by applying per capita derived from hospital survey.

The dangers inherent in generalizing from local figures become obvious on viewing the per capita arrived at in Du Mez's study of Allegany County, Md., and those resulting from the six studies made by the Committee on Drug Addictions. The lowest figure, that of Gary, Indiana,—3.39 grains—is but one-fourth the amount of the highest figure obtained—13.72 grains in the Elmira, New York study.

TABLE XIV
ESTIMATED NEEDS FOR CONTINENTAL UNITED STATES FOR PERIOD COVERED ON BASIS OF PER CAPITA USE IN SIX COMMUNITIES STUDIED

Cities and adjacent districts	Per capita use		Application to Continental United States *	
	Theoretical basis	Practical basis	Theoretical basis	Practical basis
	gr.	*gr.*	*lbs.*	*lbs.*
Opium				
Sioux City, Ia.	4.07	4.41	64,342	69,718
Montgomery, Ala.	13.28	13.99	209,944	221,168
Tacoma, Wash.	3.89	4.17	61,497	65,923
Gary, Ind.	3.39	3.74	53,592	59,125
Elmira, N. Y.	13.72	14.14	216,900	223,540
El Paso, Texas	4.57	5.	72,247	79,045
Coca Leaves				
Sioux City, Ia.	40.64	40.65	642,480	642,638
Montgomery, Ala.	20.66	20.67	325,667	325,824
Tacoma, Wash.	29.12	29.14	460,360	460,676
Gary, Ind.	11.25	11.26	177,852	178,010
Elmira, N. Y.	25.93	25.93	409,929	409,929
El Paso, Texas	8.83	8.83	139,594	139,594

* Population = 110,663,502—Based on intercensal estimate of the U. S. Bureau of the Census.

Such wide variations preclude the possibility of employing the average figure derivable from these studies as representing general conditions. It is quite conceivable that had more communities been studied even greater variations in local use might have been exposed and a very different "average" figure might thus result. Du Mez says in explaining the selection of Allegany County, Md.: " . . . it was thought that Allegany County represents as nearly as possible a normal unit . . . where conditions prevail which can be taken as typical of the country as a whole." The reasons for the selection of the six communities studied by the Committee on Drug Addictions have been stated above but in view of the final figures reached we must conclude that any one or none of the seven localities studied may be typical of the whole country.

As to what factors contributed to these widely different findings we may only speculate as yet. The rôles played by such possible influences as disease incidence, population composition, occupation, medical training and custom, sanitary equipment, etc., as well as of other less obvious factors have not been determined and cannot be accounted for. We believe, therefore, that in spite of these studies the selection of a per capita figure susceptible of general application must still be more or less arbitrary and therefore hazardous.

In the use of any per capita figure obtained from studies such as the above of the legal distribution of the drug as a basis for the computation of narcotic requirements, we should take into consideration a factor which affects in varying degree the amount of the drug legally distributed. Such a factor is comprised in the purchase of their supplies of the drug from the illicit peddler by so-called legitimate cases of addiction in order to avoid official record, because their physicians are afraid to prescribe for them, or for other reasons.

In the present use of the term "legitimate user" we refer to those individuals who for any reason are incurable and hence require the continued use of the drug and to those who because of lack of facilities have been unable to find relief.

That such cases of legitimate use exist is known, but their number and the extent to which they affect the above estimated per capita is at present a matter of speculation.

That the findings in the six studies made by the Committee on Drug Addictions were influenced by this factor is very probable. Thus in the two communities giving the highest figures of per capita use—Montgomery, Ala., and Elmira, N. Y.—special arrangements existed for supplying incurable cases of addiction through legal channels, while in the other four localities in which the legal use of opium and its preparations was very much less, no such provision had been made and the assumption is that to a greater degree in these localities such cases secured their supplies from other than legal channels.

Another estimate of narcotic use has been made recently as the result of a questionnaire sent out by Dr. Carleton Simon in June, 1923, to all of the physicians and dentists in New York State. Simon reports as follows: [22]

---

[22] Simon, C.—Survey of the Narcotic Problem. J. A. M. A. March 1, 1924. Vol. 82. No. 9. pp. 675-679.

> "As to the quantity of narcotics used and prescribed by physicians and dentists in the state of New York as an index to the legitimate demands per capita, replies to the questionnaires revealed that in 1922, 7,559, or 51.37 per cent, of the physicians of this state prescribed 1,392 ounces, or 43,296 gm., of morphin, and 30 ounces, or 933 gm., of heroin.
>
> "The basis of 1,392 ounces, or 43,296 gm., of morphin used by 7,559 physicians established an average of 5.727 gm., for each physician, which, when applied to 14,715 physicians in the entire state, gives a total of 2,709 7/10 ounces, or 84,272 gm., of morphin prescribed by the physicians of this state during the year 1922.
>
> "On this basis also, 30 ounces, or 933 gm., of heroin prescribed by 7,559 physicians would give an average of 0.1234 gm. for each physician, which, when applied to 14,715 physicians in the entire state, gives a total of 58 88/100 ounces, or 1,815.83 gm., of heroin prescribed by the physicians of this state during the year 1922."

On the above basis of 5.727 gm. morphin and 0.1234 gm. heroin for each physician, the needs of the 145,966 physicians in the entire country in these two drugs would be 835,947.28 gm. or 29,487 oz. morphin and 18,012.2 gm. or 635.36 oz. heroin. It should be noted that this survey did not cover opium derivatives in any other forms than morphin and heroin. Likewise it did not include the use of opium and its preparations in hospitals and allied institutions and research laboratories, or the amounts used in exempt preparations sold over the counter.

Two more recent estimates of the amount of opium required for medical purposes are of interest as they are the result of different methods from those already considered.

In 1926 in the "Report by the Government of the United States of America" on "The Traffic in Opium and Other Dangerous Drugs for the year ended June 30, 1926," certain figures are given showing the per capita use, in grains of morphin, of morphin and crude opium in continental United States. This report does not include in its morphin per capita figure the amount of codein used in terms of morphin from which codein is made, but limits itself to what it considers the two important drugs—opium and morphin—inasmuch as it states that codein has but slight habit-forming effect. The following quotation is self-explanatory:

> ". . . . During the year 1926 the quantity of morphine sold by manufacturers thereof, less the quantity exported, totaled 102,845 ounces, which is probably a fair indication of the home consumption of this drug in whatever form required for legitimate purposes. In this connection it may be noted that the figure for legitimate morphine consumption during 1925, ascertained in the same manner,

was 105,235 ounces. The officially estimated total population of the continental United States on June 30, 1926, was 117,136,000. The total net sale of 102,845 avoirdupois ounces of morphine is equivalent to 44,994,687.5 grains, which, divided by the population as officially estimated, would indicate an average per capita consumption for 1926 of 0.384 grain. Similarly, during 1926, a net quantity of 10,736.5 pounds of opium in medicinal form was sold for domestic use, or an equivalent of 75,155,500 grains. This figure, divided by the figure for the officially estimated population, gives 0.64 grain as the per capita consumption of opium for 1926. Since opium is equivalent in morphine to only about 10 per cent of its weight, it follows that the per capita consumption of opium in terms of morphine is equivalent to 0.064 grain. The two figures added together give a total per capita consumption for 1926 covering opium and morphine combined of 0.448 grain or, with slight approximation, 0.45 grain. It appears unnecessary to consider other products of opium in this connection, such as codeine, dionin, narcotine, as their habit-forming effect is slight as compared with opium and morphine. Moreover, since the legitimate drug market in the United States is practically devoid of heroin, it is unnecessary further to consider that drug in determining the domestic consumption for legitimate purposes. The Government, therefore, urges all concerned to take notice of the foregoing figure and fully observe that the annual legitimate consumption in the United States of the admittedly dangerous and vicious habit-forming drugs producible from the poppy plant is less than the equivalent of one-half grain of morphine per person."

The figure given in the above quotation of 0.45 grain of morphin as representing the per capita use of this drug in continental United States is not comparable with figures which have been published from time to time dealing with the opium per capita consumption of continental United States, or with the opium per capita consumption of other countries, inasmuch as codein is not considered.

In another paragraph this report states that the amount of codein estimated to be used during the same fiscal year is 136,220 ounces. In order to determine the opium per capita consumption involved in these various amounts, we have converted the codein into grains of opium which would have been used in the manufacture of this codein. In the following table are given the figures involved:

Morphin used in terms of opium	449,946,875.0	grains
Opium used as such	75,155,500.0	"
Codein in terms of opium used for its manufacture	662,180,555.0	"
Total, in grains of opium	1,187,282,930.0	"

This total represents the number of grains of opium used in continental United States—1,187,282,930. Divided by the official estimated population of 117,136,000, we obtain 10.13 + grains as the opium per capita figure for continental United States. This figure is higher by approximately 3 grains than that estimated to be sufficient by the Advisory Committee on Opium and other Dangerous Drugs.

In 1927 the "Report of the Government on the Traffic in Opium and Other Dangerous Drugs" supplies similar information to that given in the report just quoted. Making the necessary calculations, we find that for the fiscal year ending June 30, 1927, the opium per capita figure for continental United States was 9.83 grains.

In considering these figures, it must be borne in mind that they represent with considerable accuracy the amount of drugs "sold by manufacturers," as the report states. However, they do not take into consideration the stocks on hand at the beginning and end of the fiscal years in retail drug stores, hospitals, and in the hands of physicians, dentists, and veterinarians. As has been stated already the actual consumption figure can be determined only from the end distributors, i.e., retail druggists, hospitals, physicians, dentists, and veterinarians.

CHAPTER XII

CONTROL (*continued*)—STATE

As an outgrowth of the poison laws, of laws dealing with the regulation of the practice of pharmacy, or otherwise, most of the states have been operating for a longer or shorter period under some law seeking to control and bring within certain prescribed channels the sale and distribution of a group of drugs commonly known as narcotics. Etymologically such a classification includes any drugs producing sleep and in some states the list of proscribed drugs includes not only the true opiates but many of the milder soporifics.

The state anti-narcotic laws as distinct from the poison laws were the result of accumulating knowledge of the misuse chiefly of opium and cocain.

As we have seen in previous chapters the development of the problem under consideration was gradual, largely the outgrowth of professional treatment and self-medication as well as of dissipation or actual criminal intent. The awakening of the public—lay, professional, and legislative—was likewise gradual and here and there both municipalities and states sought to prevent or control the condition by legislative enactment.

The custom of smoking opium, which first reached this country through the importation of coolie labor, first caused alarm and resulted in the many laws directed at this practice and at the maintaining of opium "dens." That this was but a portion of the problem, however, became apparent and other uses of opium and of coca and certain other drugs were included in these local laws.

The first anti-opium law passed in this country as far as we have been able to determine was, according to Kane, a city ordinance enacted in San Francisco in 1875 as a result of the conditions arising out of the smoking of opium, which practice was rapidly increasing among the whites. This ordinance dealt exclusively with smoking opium, its possession, the possession of opium pipes and the conducting of smoking houses or "dens."

The next anti-narcotic law, according to Kane, was passed in Virginia City, Nevada, about 1876. As this ordinance failed to effect control of the situation, the State Legislature of Nevada passed a stringent law a year or two later.

In 1882 the New York Assembly passed a bill introduced by Senator Koch, which prohibited the maintaining of places where opium was smoked under a penalty of three months' imprisonment or a fine of $500.00 or both. This act also included within its prohibition persons visiting such places for the purpose of smoking opium.

As so frequently happens in social reform, it required this more spectacular method of opium use, the character of the places in which it was smoked, chiefly in Chinatown, and the attendant social evils, to awaken public and official interest. As a matter of fact at the time of the passage of these laws, opium smoking among the whites had not reached large proportions. In 1880 Kane estimates that the number of whites involved was 6,000 and the number of Chinese was 20,000. The total number, therefore, was insignificant as compared with the number of individuals using opium in other forms, especially morphin hypodermically, as will be seen by referring to the survey conducted by O. Marshall in Michigan in 1878, page 11.

As during the past twenty-five or thirty years, first one state and then another passed anti-narcotic laws, especially as these laws became more rigid, sporadic illicit traffic in the drugs began to develop and the efforts of one state to eliminate the problem were nullified, it was claimed, by smuggling from nearby states where anti-narcotic laws as yet had not been enacted. Thus a demand arose for federal legislation that might control the interstate traffic in these drugs and bring about greater uniformity in the methods of their handling. Partly as a result of this demand and partly to fulfill our treaty obligations the Harrison Narcotic Act was passed in 1914.

We shall not discuss the older laws of the individual states. That in general they failed of their purpose is manifest from the present status of the problem. The present laws—digested in what follows—represent the most recent legislative control measures.[1] How far they have succeeded toward the solution of the problem is more a matter of conjecture than accurate opinion as the painstaking studies needed to determine this have never been made and—as we have pointed out in the previous chapter—are becoming more difficult of accomplishment.

---

[1] The digest covers laws passed prior to July, 1927, in the various states and the District of Columbia.

I. DRUGS INCLUDED

In Table I [2] will be found listed the drugs included by the various states as described in most recent anti-narcotic laws.

It will be seen on consulting this table that, while a considerable variety of drugs is dealt with, two of the number stand out as those most commonly considered dangerous to the public health or welfare, namely, coca and opium. A critical study of the wording of a number of the state laws reveals a considerable amount of laxity in their construction and phraseology, and while the intent is usually clear, the wording of important paragraphs is such as to permit, apparently, of considerable evasion. Thus, in some instances, certain alkaloids or salts of erythroxylon coca are specified while others are omitted, as is also the crude drug itself. In some instances, as will be seen by a study of the table, even the better known of the synthetic preparations of cocain are mentioned in detail while the word "coca" appears nowhere in the law. The same may be said of the phraseology dealing with opium. With a few exceptions, there is no apparent attempt at uniformity, a circumstance which is daily becoming more apparent and which, in many instances, handicaps the administration of these laws and limits their usefulness as desirable supplements to the federal laws dealing with these matters.

Erythroxylon coca or one or more of its preparations is included in the anti-narcotic laws of every state. In this particular, it occupies a unique place among the drugs under discussion. On the contrary, opium and its derivatives are omitted from the anti-narcotic law of South Carolina.

The next most commonly included drug is chloral, which finds a place in the laws of sixteen states.

More recently, another group of drugs has found its way into the anti-narcotic laws of a number of the states. This group is included under the genus of *cannabis sativa* which includes the two species *cannabis indica* and *cannabis americana.* Their therapeutic properties and physiologic action differ only in degree, the Indian variety being more active than the domestic. One or another of these drugs is named in the laws of the following states—Arkansas, California,

---

[2] For tables see Appendix VI.

Idaho, Indiana, Iowa, Maine, Massachusetts, Nevada, New Mexico, New York, Oregon, Texas, Utah, Vermont, and Washington. These drugs are spoken of in the laws of several of the states as "loco weed," on account of the inebriation which they give rise to in both human beings and cattle. This drug is also known under the Spanish name of *Mariahuana.*

Another drug possessing similar physiologic properties in so far as it causes inebriation, is *anhalonium lewinii,* "mescal button," "peyote," *agara americana* or *lophophora williamsii,* a species of cactus, the dried tubercles of which are consumed for the effects produced. It is included in the anti-narcotic laws of California, Colorado, Kansas, Nevada, North Dakota, and Utah.

In addition to the foregoing drugs which are usually termed "narcotic" or "habit-forming," the law of Arkansas, in addition to naming the drugs included, also includes "other potent narcotic drugs."

Although therapeutically and physiologically far removed from the narcotics, two states, Iowa and New Mexico, have employed the anti-narcotic law as a means to control the use of certain of the emmenagogues, as cotton root, ergot, oil of tansy, oil of savin and oil of pennyroyal.

New Jersey includes also stovain, alypin, tropocain and dionin.

North Dakota includes the phrase "any habit-forming drug, whatever its nature or character, or any substance or residue left after the smoking of opium."

Ohio also includes alypin, and Washington includes dionin.

II. EXCEPTIONS

In their exceptions of certain drugs, the state laws vary quite as widely as in the drugs included, and few, if any, are more strict in their provisions than is the federal law. The most common types of exception are those of a minimal dose of the proscribed drugs and of certain so-called household remedies, whether or not proprietary in nature.

Sixteen states specifically except decocainized coca leaves.

Exceptions in the case of cocain, its derivatives and synthetic substitutes, are less common and less liberal than is the case with opium preparations. Thus only three states except cocain in any quantity whatsoever from the provisions of the law. Of these three states, Texas excepts 1/16 gr., Oregon 1/6 gr., and District of Columbia ¼ gr.

to each ounce. Other states, while not excepting any amounts of cocain, do make exceptions in favor of eucain. Thus, five states except eucain, as follows: three 1/8 gr., and two 1/6 gr. to each ounce. As regards the external use of cocain in liniments, ointments, etc., twenty-three states permit its use unrestricted under such circumstances, while twenty-six do not except its use even in preparations not designed for internal use. Further, one state specifically excepts 1/6 gr. to the ounce of novocain.

In the case of opium, three states make no exceptions, while forty-six except opium in certain doses as follows: one state excepts preparations containing not more than 0.4 gr., forty-two not over 2 gr., one 4 gr., one 10 gr., while one state uses the phrase "lawful quantity" and defines this as meaning that the amount of the drug excepted shall be "left to the discretion of a reputable, qualified, registered physician."

Morphin has no exceptions in the laws of four states. The remaining forty-five make the following exceptions: two states except 1/8 gr., thirty-eight except 1/4 gr., one 1/3 gr., one 2/5 gr., one 1/2 gr., and one excepts 1 gr., to the ounce, while again one state leaves this open to the judgment of the physician with the phrase "lawful quantity."

Heroin is not excepted in any quantity by seven states, while the balance make exceptions as follows: thirty-two 1/8 gr., one 1/6 gr., seven 1/4 gr., one 2/3 gr. to the ounce, while the remaining state again employs the phrase "lawful quantity."

Codein is not excepted by ten states. The others make exception for this drug as follows: two except 1/4 gr., two 1/2 gr., thirty-three 1 gr., one 2 gr., to the ounce, and one in "lawful quantity."

In addition to the foregoing exceptions, seven states make exceptions of cholera and diarrhoea mixtures when sold and used in good faith as such, eight except Dover's powder, while one state, California, requires that paregoric be sold only on prescription, and the remainder include it under the exempt preparations.

Other exceptions of preparations containing opium or its derivatives are made in the case of liniments and ointments in twenty-seven states, and in the case of preparations designed for external use only in thirty-four states, one of which further qualifies the exceptions by stating that such preparations "must contain other active drugs in sufficient proportions to confer upon them other and additional medicinal properties than those possessed by the unmixed drugs." It should be noted, however, that twenty-five states do not except the use of cocain in liniments and ointments.

Chloral is not excepted in any quantity whatsoever in thirty-eight states, while in eleven states it is excepted as follows: two except 2 gr., six 10 gr., one 20 gr., one 120 gr., and one 240 gr. to the ounce.

Of the ten states which proscribe the use of *cannabis sativa,* eight states permit its use in the following quantities: four in ½ gr., one in 1 gr. and three in 4 gr. to the ounce; one of these excepts its employment in corn cures in any quantity. The ninth state excepts the use of this drug for medicinal purposes only, and the tenth excepts it in any quantity when used for medicinal purposes.

In addition to the foregoing exceptions, the following should be noted:

Kentucky excepts antispasmodics of the National Formulary official at the time of sale.

Maine excepts preparations containing opium sold in good faith as remedies for neuralgia.

Maryland excepts laudanum and *bona fide* proprietaries containing codein.

Pennsylvania provides that no preparation containing any opium or coca leaves or any compounds or derivatives thereof in any quantity whatsoever may be sold, dispensed, distributed or given away to or for the use of any known habitual user of drugs or any child of 12 years of age or under except upon prescription.

Tennessee excepts Godfrey's Cordial, Bateman's Drops and Castoria.

Vermont excepts compound medicinal tablets, pills and powders containing not over 1/20 of a grain of morphin, or ¼ of a grain of codein or any of their salts except heroin to each pill, powder or tablet.

Wyoming excepts preparations recognized by the U.S.P. or N.F. or pharmaceutical preparations to be used in the filling of prescriptions written by a regular practicing physician.

III. SALE TO CONSUMER

In the ultimate distribution of the proscribed narcotic drugs, every state attempts to limit the channels through which these drugs shall reach the consumer by confining their retail distribution to the dispensing, administering or prescribing by one of three professional groups—physicians, dentists or practitioners of veterinary medicine. In some states only one or two of these three groups are included among those authorized to order retail sales. Twenty-five states specifically provide that physicians, etc., may dispense or administer, while twenty-four do not include such a provision. Most of the states specifically provide that prescribing and dispensing may be carried on in the course of professional practice only and some further limit the dispensing to personal attendance of the physician, etc. Thus, while forty-four states require that prescriptions be required from one or another of the three groups mentioned, five states limit the distribution of these drugs to the consumer through the prescription of physicians alone. Among those permitting physicians, dentists and veterinarians to authorize the dispensing of these drugs, there are certain slight variations in the qualifications required. Thirty-two states require simply that the individuals in question be licensed; two require that in addition to being licensed, the physician must also be registered under the Harrison Narcotic Act; four states specify that the licensing may be in the state in which the individual resides; four states further restrict those qualified to dispense narcotics by specifically requiring that they be registered under the Harrison Narcotic Act and two that the individual be of good habits, not intemperate or a user of drugs.

Eighteen states further restrict the sale to consumer by providing that the proscribed drugs may not be distributed to addicts except under certain conditions. In the majority of cases this restriction does not apply if the drug is prescribed, etc., for treatment.

IV. SALE TO DEALER

The state anti-narcotic laws for the most part have not made any attempt to regulate the wholesale distribution of narcotic drugs as has the federal law. Thus, thirty-one states specifically exempt sales by wholesalers from all provisions of their laws. Of the remainder three states require that wholesale orders be written on official order forms similar to those required by the federal law; six states require an order from an authorized person and that such order shall be kept on file for two years; three require that such sales be made only when official order forms, of local design, are used; two require both an order from an authorized person and an entry of the sale in a book kept for the purpose; one requires that the wholesale disposition of these drugs be carried on under restrictions similar to the federal law. The three remaining states omit all mention of wholesale transactions.

V-VI. RECORD TO BE KEPT BY PHARMACISTS AND PHYSICIANS

As a further means of checking illegal sales, the anti-narcotic laws have sought to provide for the keeping of a record of sales by retail druggists. Nine states require that prescriptions or orders from physicians, dentists or veterinarians be kept permanently on file for inspection by authorized agents. Three states require that such prescriptions be kept on file for five years; two for three years; twenty-one for two years; one for one year and four require simply that they be kept on file, without specifying a period. Nine states make no requirements relating to the keeping of records by pharmacists.

As a further check upon the distribution of the proscribed drugs, certain anti-narcotic laws have included in their provisions that physicians, dentists or practitioners of veterinary medicine who are permitted to prescribe narcotics shall keep a record of their prescriptions. As in the case of the pharmacists, the period during which these records shall be kept and the method and form of recording vary. Five states require that records of prescriptions be kept on file without specifying the period for their preservation; three require that they be kept on file for two years and one that they be kept on file five years; six require that such records be kept except of drugs dispensed when the physician is in personal attendance on patient; one requires that the records be kept on forms supplied by the State Board of Health for two years; and two that they be kept in the same manner as required by the federal anti-narcotic law. In addition to specifying that a record must be kept on file, one state provides that in the case of addicts these records need be kept only two years; one state provides that record of exempts be kept on file only two years and one state specifies that record of dispensing only need be kept. Twenty-eight states require no form of record keeping whatsoever.

VII. POSSESSION

The possession of narcotic drugs by unauthorized persons is obviously a matter of importance from the administrative point of view and is made unlawful in thirty-four states, fifteen omitting reference to the subject.

VIII. SMOKING OPIUM

Among the older state laws drafted at a period when the smoking of opium and the existence of opium dens were more of a problem than to-day, special provisions against the use, sale or other distribution of smoking opium were introduced, and we find that in thirteen states the possession or use of smoking opium or the conducting of opium dens or places where opium is held or used for smoking is prohibited; thirty-six states omit specific mention of smoking opium.

IX. RESTRICTIONS SURROUNDING PHYSICIANS

Aside from the keeping of records, further restrictions have been thrown around the prescribing, dispensing and administration of these drugs by physicians and others licensed to handle them. These restrictions vary considerably in different states, but occur in one form or another in the laws of thirty-six states while thirteen states make no attempt to regulate physicians in their practice.

The most commonly employed provision is that of prohibiting the prescribing of these drugs for habitual users except for the purpose of treatment "in good faith." This provision occurs in the laws of seventeen states. In addition, two states require that a record of cases be kept, one state permits the administration to users only in order to save life, and one only when decreasing doses are employed.

The restrictive provisions found in the laws of other states differ too widely to be grouped and therefore require individual handling.

Arizona limits the period during which a physician may prescribe for an individual suffering from drug addiction to three weeks, after which a consultation must be held with a medical representative of the Board of Health.

California provides that a physician or other person licensed to handle narcotic drugs may not administer these drugs to himself as an habitual user nor to habitual users except for their treatment, limiting the amount of the prescribed drugs to certain daily quantities—opium 8 gr., morphin 4 gr., cocain 2 gr., heroin 2 gr., and further providing, after 15 days' treatment, for a 50% reduction of these doses and after 30 days requiring the entire discontinuance of the drugs. The law further requires that cases of this nature be reported to the board of pharmacy when their treatment is undertaken, and that their progress be further reported in 15 days and at the end of 30 days.

Colorado permits physicians to prescribe, dispense or give away these drugs to habitual users "in the course of their professional practice" and that records of such drugs sold, prescribed or dispensed shall be kept for a period of two years. Further, physicians who are shown to be addicted to the use of these drugs "in a manner contrary to the public welfare" may have their licenses revoked.

Delaware requires that the prescribing of these drugs be in good faith and in the course of the physician's professional practice for medicinal purposes only. It also requires that physicians keep a record of all drugs so dispensed, distributed or given away for a period of two years.

Florida provides that physicians may prescribe, dispense or administer for the treatment or cure of disease in the course of their professional practice, but not to persons addicted to their use, except that for the treatment of "habit or addiction" they may prescribe or administer these drugs in reducing doses to an habitual user, while personally controlling and supervising such user. In the event that such user shall prove "refractory" or "difficult of treatment," the physician is required to report him to the state board of health, the local board of health or the county judge. The law also requires that such report shall be made in case the patient "does not pursue his treatment in good faith until final cure." Should the case prove to be incurable and so declared after investigation by the county judge and an agent of the state board of health, opium or its preparations may be prescribed.

Idaho provides that physicians may furnish or administer these drugs to a patient under his immediate care or treatment.

Indiana prohibits physicians from writing prescriptions for any habitual user of these drugs but they may "legitimately administer said drugs."

Massachusetts and Rhode Island in their anti-narcotic laws provide certain restrictions surrounding the practice of medicine which are not found in the laws of any other states in that they require that physicians shall only prescribe, dispense, administer or give any narcotic drug to any person when the drug is obviously needed for the treatment and cure of a disease or ailment and *not needed for any condition or disease directly due to any drug habit or resulting solely from the failure of an habitual user of narcotic drugs to procure the particular narcotic drug to the use of which he is addicted.* These two laws provide, however, that a physician may "personally administer" any narcotic drug at such time and under such circumstances as he in good faith and in the legitimate practice of medicine believes to be necessary for the alleviation of pain and suffering or for the treatment or alleviation of disease.

A further unique provision of these laws is that physicians, dentists or others licensed to handle narcotic drugs shall not solicit by public advertisement or otherwise applications for prescriptions for, or sale of, narcotic drugs nor shall they advertise any treatment the principal element of which consists in the administering, dispensing, furnishing, giving away or delivering of a narcotic drug.

Montana, in a law passed in 1921, has introduced certain provisions hitherto not included in laws of this nature. While permitting physicians to dispense, administer or distribute these drugs in good faith in the course of their professional practice, the law requires that a physician who prescribes, dispenses or administers these drugs to a person known or believed by him to be an habitual user or a drug addict shall report within 48 hours to the county attorney in the county in which he prescribed, the "name, address, physical and mental condition and any necessary substantial information regarding such cases."

The law further requires that if a physician shall prescribe, administer or give to a patient any of these drugs daily for more than 30 days, such physician shall register with the county attorney the name of such person together with a statement of his physical and mental condition and a prognosis as to the probable future necessity of prescribing, administering or giving of such drugs to such patient, and such prognosis shall include an estimate as to the length of time which, according to the judgment of the physician, will be required to remove the necessity of administering the drugs in question to such patient. It shall then become the duty of the county attorney, upon receipt of such notice, to file immediately complaint against such habitual user in the district court of his county.

The Montana law also requires that physicians shown to be addicted to these drugs "in a manner contrary to the public welfare," after a fair hearing, may have their licenses revoked and that these later may be re-issued.

In spite of the specific course above outlined to be followed by physicians in the treatment of drug addicts, the law states in another section that the prescribing for, dispensing, administering or giving away of such drugs to an addict for self-administration by such patient shall not be deemed to constitute in itself legitimate medical treatment. This is apparently a contradiction of the privileges of the physicians in relation to the handling of these cases as set forth in the preceding paragraph which permits, under certain conditions, the prescribing, dispensing or administering of these drugs to an addict for a period of thirty days.

Nebraska provides that physicians may administer these drugs only in the course of their professional practice when necessary for medical purposes, *except* it shall be unlawful for physicians to prescribe or administer them to addicted persons, *except* a "reputable and duly licensed practicing physician" may "personally administer" to an addicted person when it in good faith has been determined by two reputable and duly licensed physicians, in consultation, to be absolutely necessary in the medical treatment of said cases, in which case the physician administering said drugs or any of them, shall make and keep a record in writing of the name and address of the person to whom said drugs were administered, date administered, form and quantity administered, name and address of consulting physician, date and place of consultation, which record shall be preserved for a period of at least two years.

New Jersey provides that physicians may administer, dispense or prescribe these drugs only for a legitimate and necessary purpose in the practice of their profession.

Ohio provides that physicians may administer, dispense or prescribe these drugs only for a legitimate and necessary purpose in the practice of their profession.

Pennsylvania prohibits physicians from prescribing, dispensing or administering these drugs to an habitual user except for the cure or treatment of some malady other than the drug habit, provided, that a physician may in good faith prescribe or dispense opium in any form for the cure of the habit of taking such drugs and not for the purpose of satisfying a craving for the drug. In such cases physicians shall make a physical examination of the patient and report to the state board of health the name and address of the patient and the amount of drug prescribed in the first treatment. When the patient leaves his care, the physician shall report to the state board of health the result of his treatment.

South Dakota prohibits a physician from prescribing, furnishing, selling, administering or giving away any of these drugs except when, in the opinion of such physician, the taking of such drug by the person for whom prescribed will be beneficial to such person.

Washington provides that licensed physicians treating any addict, upon beginning said treatment, immediately shall report the same to the health officer, and such report shall give the name of the person receiving such treatment and such other information as shall be deemed necessary by the State Board of Health.

X. PROVISION FOR ADDICTS

The state anti-narcotic laws, in some instances, include provisions for indigent or criminal addicts, but for the most part provisions for the treatment of these cases are contained in other laws than those dealing with narcotics.

In seven states, according to the anti-narcotic laws, these cases may be committed to city, county or state hospitals. One state provides that such cases may be committed to a city, county or state hospital or a licensed private hospital. Another state designates simply "a" hospital, while two others provide also for voluntary commitment. Four states provide for commitment to an "insane hospital," two states provide that these cases may be treated by physicians under restriction, while one state simply designates that the state board of health is empowered to make regulations as to the treatment of addicts. Therefore, thirty-one states make no provisions whatever in their anti-narcotic laws for these cases.

XI. REGISTRATION OF ADDICTS

None of the states requires at the present time that narcotic addicts be registered as such directly, though such a requirement was incorporated in a former law of New York state. Three states, however, Arizona, Montana and Pennsylvania, require that physicians treating such cases report them to the state board of health.

XII. DEFINITION OF ADDICTS

Although the laws of the various states frequently employ the term "addict," "habitual user," "habit," "habitué," etc., none of these terms is defined except in the laws of two states. Montana describes as a narcotic addict "any person who has needed or demanded the prescribing for, dispensing or administering or in any manner the giving of opium or coca leaves or any of their derivatives, salts, preparations or compounds at more or less regular intervals for thirty consecutive days prior to the day such person applies to a physician or to a physician of any institution for the prescribing for, dispensing, administering or the giving in any way of any such drug or their derivatives." Washington defines an addict as follows: "A narcotic addict is one who habitually uses a narcotic drug."

XIII. PROVISIONS FOR ENFORCEMENT

There is a considerable amount of diversity as to the powers selected in the different states to enforce anti-narcotic laws. In eleven states, the law does not particularize on this point, leaving the matter in the hands of the duly constituted general law enforcement officials. In eleven states, the boards of pharmacy have charge of prosecutions brought under the drug laws: in eleven, the matter is left in the hands of the state boards of health; in two, the bureau of foods, and drugs or the food commissioner is charged with the enforcement; in two, the laws designate the county attorneys as enforcement officers; in one it is left to the department of registration and education; in one, to the justice of the peace; in one, to the secretary of agriculture; in one, the superintendent of police is the enforcing officer; one, the board of pharmacy and attorney; one, the state board of health and food commissioner; one, the peace officer and county attorney; one, the board of pharmacy and state board of health; one, the state board of health and internal revenue agents; one, the "board of pharmacy and district attorney and officials in charge of drug and food work in state"; one, the department of foods, fertilizers and dairies, and one, the board of pharmacy, police and sheriffs.

XIV. PENALTIES FOR VIOLATION

The most common penalty is misdemeanor carrying with it a fine varying from not less than $25 to not more than $2000, and/or not more than ten years. In ten states, the penalty is felony with an accordingly higher fine or longer term of imprisonment.

XV. MISCELLANEOUS PROVISIONS

In addition to the restrictions relating to the drugs themselves, six states include in their anti-narcotic laws restrictions surrounding the purchase or possession of hypodermic syringes and needles.

In Alabama, the possession of a federal license without the fulfilling of the state qualifications is a violation of the state law in the case of dealers.

The California state law provides that the state board of health shall furnish upon request in writing from the state board of pharmacy, a list of incurable diseases or ailments which in its judgment, might require excessive amounts of narcotic drugs to be prescribed for or furnished by a physician for relief or benefit. In a communication under date of August 27, 1927, the secretary of the California State Board of Pharmacy states that the State Board of Health has been unable to come to an agreement on such a list and has therefore not supplied one.

The California law requires that prescriptions containing more than ten grains of chloral hydrate or four grains of Indian hemp or loco weed to the fluid ounce may not be refilled except upon the written order of the prescriber, and no copy of such prescription shall be given.

The possession of pipes or attachments or contrivances for smoking opium or extracts or tinctures of hemp or other narcotic preparations of hemp or "loco weed" is made a misdemeanor by the California law.

In 1917, Colorado passed a separate act, making it a crime to sell, give way or dispose of *anhalonium* or peyote.

In Connecticut and Delaware, physicians, veterinarians and dentists shown to be addicted so as to render them incapable of performing their duties may have their licenses revoked.

In 1920, a law was passed in Kansas, prohibiting the sale, furnishing or giving away or possession of peyote.

In 1921, Minnesota passed a law relating to habitual offenders, making the penalty imprisonment, not to exceed three years.

The Montana law undertakes to interpret the words "good faith" as used in the law to mean that when a physician prescribes, dispenses, etc., these drugs, it shall be for the actual relief or treatment of disease or surgical operation, but if such prescribing or dispensing is not being done for relief in the treatment of disease or surgical operation and if such drugs are being used for the purpose of providing the drug addict with the aforesaid drugs sufficient to keep him comfortable it shall be considered as a perversion of the meaning of the words "good faith."

In 1923, the board of pharmacy of North Carolina notified all general merchants and general retail dealers that they might not sell exempt preparations, such as paregoric, Godfrey's Cordial, Bateman's

Drops, etc., after the expiration of their current federal licenses—June 30, 1924.

In 1923, Texas passed a law making it a felony to carry a pistol or other weapon or arm while possessing for unlawful sale, furnishing or giving away, any of the proscribed drugs, and making a special penalty of imprisonment for not less than one year or more than three years.

The Washington law provides that state, county and municipal health officers, or their authorized deputies, who are licensed physicians, within their respective jurisdictions, are directed and empowered, when in their judgment it is necessary to protect the public safety, health and morals, to make examinations of persons reasonably suspected of being habitual users of any narcotic drug, and to require persons whom they have reasons to suspect to be habitual users of any narcotic drug to report for treatment to an approved physician, and continue treatment at his own expense until cured, or to submit to treatment provided at public expenses, until cured, and also to isolate or quarantine habitual users of such narcotic drugs or their derivatives. Such officer, deputy or physician shall make a written finding that such person is an habitual user of a narcotic drug, which finding shall be filed in his office; provided, that such habitual users shall not be isolated or quarantined until the state board of health, by general regulation, first shall determine that the quarantine or isolation of all habitual users is necessary: provided, further, that any person suspected as herein set forth may have present at the time of his examination, a physician of his or her own choosing: and provided further, that the suspected person shall be informed by the health officer of his or her rights under this act.

Any person convicted under the provision of section 4 of this act or any person who shall be confined or imprisoned in any state, county or city prison in the state and who reasonably may be suspected by the health officer of being a narcotic addict shall be examined for and if found to be an habitual user of said drugs, or any of them, shall be treated therefor at public expense by the health officers or their deputies who are licensed physicians. The prison authorities of any state, county, or city prison are directed to make available to the health authorities, such portion of any state, county or city prison as may be necessary for a clinic or hospital wherein all persons who may be confined or imprisoned in any such prison, and who are habitual users of said drugs or their derivatives, may be isolated and treated at public expense until cured, or, in lieu of such isolation any such person, in the discretion of the board of health, may be required to report for treatment to a licensed physician, or submit to treatment provided at public expense, as provided in section 6 of this act. Nothing herein contained shall be construed to interfere with the service of any sentence imposed by a court as a punishment for the commission of crime.

Any person committed to quarantine under the provisions of section 6 or 7 of this act, feeling aggrieved at the finding of the health officer that he or she is an habitual user of such drugs, or at the finding that he or she be committed to quarantine, shall have the right of appeal from such finding to the superior court of the State of Washington for the county in which said person is quarantined.

Any person held in quarantine deeming himself cured may make application for discharge to the health officer ordering commitment, or his successor, upon which application findings in writing shall be made within five days therefrom. In the event that the application is denied, the applicant may appeal to the superior court in the manner herein provided from the findings of the quarantine officer in charge that he or she is not cured of such habit: provided, however, that said appeal shall not lie until after said person shall have been in quarantine for a period of at least six months.

Wisconsin provides that no person shall take or use narcotic drugs habitually, excessively or except in pursuance of a prescription for such permitted use as is prescribed in subsections 5 and 6 of this section. The possession of narcotic drugs by persons not authorized by law to have such possessions, or their possession of a hypodermic syringe and hypodermic needle used in the administration of drugs shall be prima facie evidence of the unlawful use of such drugs. Any person violating the provisions of this section shall be guilty of a misdemeanor and upon conviction shall be punished by a fine of not more than one hundred dollars, or by commitment to an institution for the treatment of drug addicts, for a period not less than six months, or until such person shall be cured of his addiction to the use of narcotic drugs, but not exceeding one year; provided, however, that upon the certificate of the superintendent of the institution to which such person has been committed, that such person has been cured of his addiction to the use of narcotic drugs, such person shall be released, and such commitment terminated. Any person so committed who has been confined in such institution for at least six months, and who has been refused a certificate of cure and release by the superintendent of such institution may obtain a trial of the question of the cure of his addiction to the use of drugs in the same manner and with the same effect as is provided for the retrial of insane persons by section 51.11.

Anti-Narcotic Legislation in New York State:

While we have had neither the time nor the facilities at our disposal to undertake a study of the results of the operation of the narcotic laws in the various states as evidence of their success or failure in the solution of the problem, we have been able in the course of other work, more through the accident of proximity and contact than otherwise, to collect data relating to the results obtained through the enforcement of the various anti-narcotic laws of New York State. Although presumably not typical of other states, the history of this state's legislative activities is of distinct interest and therefore is given below.

The first so-called anti-narcotic law was passed by New York state in 1913. The only drug dealt with was cocain and its derivatives and not until 1914 was the sale of opium, its salts, alkaloids, derivatives, compounds, or preparations and chloral dealt with by a New York state law. This was known as the Boylan Law and became operative April 14, 1914. It prohibited the sale of the drugs named by a pharmacist, druggist, or other person except upon the prescription of a duly licensed physician, veterinarian, or dentist. This law exempted proprietary remedies within certain amounts of narcotic content. The law further provided that prescriptions should contain certain information relating to the condition of the patient and prohibited physicians, veterinarians, and dentists from prescribing any of the drugs referred to in the act except "after a physical examination of any person for the treatment of disease, injury, or deformity." It also required that the prescription be kept on file by the druggist and made the possession of these drugs, except by dealers, physicians, veterinarians, and dentists, a misdemeanor unless such possession was authorized by the possession of a certificate described in the law. The law further provided that the state commissioner of health should supply to board of health officers official order blanks, serially numbered in duplicate for distribution to pharmacists, druggists, physicians, dentists, and veterinarians upon which all orders for the purchase of any of the drugs enumerated should be written. Physicians, druggists, pharmacists, veterinarians, and dentists were required to keep a record for five years of the name and address of persons to whom the proscribed drugs were administered, disposed of, or given away. The sale of hypodermic syringes and needles was prohibited except upon the written order of a physician or veterinarian. Another section provided for the commitment of habitual drug users who were defined as persons constantly using any habit-forming drug except under the direction and consent of a duly licensed physician.

In 1915 a law was passed amending the foregoing law in certain details but not changing it in general tenor or subject matter.

The next effort at narcotic control by New York state was expressed in the passage in April, 1916, of a resolution concurrently by the assembly and senate authorizing the formation of a Joint Legislative Committee to investigate and examine the laws in relation to the distribution and sale of so-called habit-forming narcotic drugs. A preliminary report of this committee, published on February 19, 1917,[3] states:

> "The Joint Legislative Committee appointed to investigate and examine the laws in relation to the distribution and sale of so-called habit-forming narcotic drugs, the manner in which such laws are enforced and the measures to be taken for the better enforcement of said laws submits the following preliminary report:
>
> "The Committee was authorized by concurrent resolution of Senate and Assembly in April, 1916, with instructions to report by February 1, 1917. The Committee was appointed in September, 1916, and met for organization in November, 1916. Under concurrent resolution of January 30th and 31st the time of the Committee for submission of its report was extended to March 1, 1917.
>
> "The Committee has held public hearings in New York, Brooklyn, Buffalo, Syracuse and Albany. These hearings have been well attended and a large amount of testimony has been taken and many valuable suggestions have been received both from those charged with the distribution of narcotic drugs and those responsible for the enforcement of the laws in respect to the sale and use of such drugs, your Committee therefore here wishes to express its appreciation for such co-operation and its indebtedness to members of the Judges and Justices Association of the State of New York, to members of the medical profession asso-

---

[3] Preliminary Report of Joint Legislative Committee appointed to Investigate and Examine the Laws in relation to the Distribution and Sale of so-called Habit-forming Narcotic Drugs. State of New York, No. 31. In Senate. February 19, 1917.

ciated in drug addiction work in the great penal, charitable and correctional institutions of the State and to laymen and members of the pharmaceutical profession who aided in its investigations.

"The statements prepared for the Committee of Judges and Justices by Dr. Ernest S. Bishop of New York, and submitted to your committee through the courtesy of Judge Cornelius Collins of the Court of Special Session, New York City, together with reprints of Dr. Bishop's writings on the subject of narcotic drug addiction, were especially useful in giving your Committee insight into existing narcotic conditions.

"Corroborating testimony regarding the problem of narcotic drug addiction also was offered by Drs. Alexander Lambert of New York City, Charles Rosenwasser, Newark, N. J., and James F. Rooney of Albany, N. Y., Franklin C. Graham, Buffalo, N. Y., and George E. Pettey, Memphis, Tenn. Other most valuable testimony was put in evidence by Chief Magistrate McAdoo, New York city, Judge Cornelius Collins, New York city, Judge John F. Brady, Albany, Commissioner of Correction Burdette Lewis, New York city and other officials and prosecuting officers of the State and city of New York.

"The evidence adduced by the hearings of your Committee shows that the problem of narcotic drug addiction has passed all bounds of reasonable comprehension in the State of New York and in the United States. In a recent report promulgated by the Massachusetts Commission, entrusted by the State Legislature with investigation of drug addiction in that State, it was estimated that 60,000 addicted lived within its confines.

"While there is no definite data at hand upon which to base an estimate as to the exact number of drug users in the State of New York, your committee believes that at least 100,000 people are now suffering from this disease.

"The vital importance of making a systematic study and classification of this affliction from a sociological and medical standpoint can not therefore be overestimated to the commonwealth.

"Lack of understanding and appreciation of the disease of narcotic drug addiction and its treatment by a large majority of the medical profession has fostered conditions which make it impossible to determine a rational procedure for treating and curing the addicted by the State at this time.

"Such absence of uniformity of opinion has worked great hardship upon the public and has laid the narcotic drug addict open to misconception, misunderstanding and medical treatment which, in many instances, has resulted in harm rather than good.

"Evidence offered by physicians shows that many addicts have died under the method of treatment existing today and that a large percentage of those discharged from institutions as 'cured' are driven back to use of narcotic through unbearable physical torture induced by improper withdrawal of their drug.

"Evidence from physicians was adduced which denied that any cure for narcotic drug addictions existed in any of the private or public institutions of this State. Evidence from other eminent physicians was adduced which bore testimony to the fact that the disease of narcotic drug addiction was curable.

"The difference of medical opinion existing in medical circles regarding this vitally important question should be made the subject of a thorough and searching investigation as a matter of the greatest importance to the welfare of a large number of people in the State of New York.

"Your Committee has found that narcotic drug addiction bears no relation in point of character and seriousness to any other known habit induced by the use of stimulants. Narcotic drug addicts, according to evidence adduced, should not be classed with the alcoholic or the tobacco addict or the cocaine habitué.

"The constant use of narcotics produces a condition in the human body that many physicians of medical authority now recognize as a definite disease, which diseased condition absolutely requires a continued administration of narcotics to keep the body in normal function unless proper treatment and cure is provided.

"Withdrawal of the drug of addiction induces such fundamental physical disorganization and unbearable pain that addicts are driven to any extreme to obtain narcotic drugs and allay their suffering by self-administration.

"Testimony of physicians coming in contact with the addicts and statements of addicts themselves show that those afflicted with this disease express every desire to secure humane and competent treatment and cure and that most narcotic drug users are willing to undergo physical torture, and often do voluntarily undergo such torture, in an effort to be rid of their so-called habit.

"In the present chaotic medical opinion on this subject, it is impossible for the addict today to either secure authentic information on the subject of his disease and its treatment, or to procure at the hands of the average physician competent treatment for his malady.

"It has further been stated by competent authorities before your Committee that drug addiction is not confined to the criminal or defective class of humanity.

"This disease, however contracted, is prevalent among members of every social class. Some physicians estimate that addicts of the so-called underworld are far outnumbered by unfortunate drug users drafted from social circles of refinement and intelligence in the State of New York, who have become addicted to the constant use of narcotic drugs, but who are able to hide their affliction from the public.

"The attitude of the public toward the narcotic drug addict, fostered by the increasing prevalence of the disease in the criminal classes and by the apparent lack of medical help, has forced such drug users to keep their affliction a secret.

"This necessity in turn, your Committee finds has apparently contributed to the existence of many unsound nostrums for the cure of narcotic drug addiction and many private institutions where this disease is purported to be cured which exist solely for the purpose of preying upon the addict.

"State investigation and regulation of such cures and institutions is recommended by your Committee.

"Your Committee is inclined to criticize the medical profession for its lack of study of the increasingly important subject of narcotic drug addiction. The only excuse which can be offered for this unfortunate condition lies in the fact that there has not been medical appreciation of the conditions and that legislation, both State and Federal, has forced upon the physician a situation for which he was wholly unprepared.

"Your Committee believes it to be one of the first duties of the State, in dealing with this grave situation, to establish a supply of narcotic drugs to which the confirmed addict shall have access, under proper State regulation, pending the establishment of rational and recognized scientific treatment for his disease.

"The Committee believes that of even greater importance is a thorough and searching investigation of all phases of the great problem of narcotic drug addiction existing in the State of New York, with the definite view of requesting or employing services of medical experts familiar with this disease and evolving from the mass of contradictory evidence at hand some order and classification which shall point to competent care and ultimate cure.

"Searching and thorough investigation is needed in order to determine and establish fundamental and recognized elements and principles which are in accord with existing facts, and which shall be available as an authoritative foundation for the guidance, decision and direction of those dealing with the addict, and for the determination of honesty, good faith and intelligent procedure in those undertaking his treatment and care.

"It has been impossible in the brief time afforded your Committee adequately to study the various treatments given in municipal, State and private institutions, with a view to recommendations on this subject, or to get the addicts' full story or detailed testimony on the subject of narcotic drug use.

"Your Committee recommends that more time be given to study conditions, and that the power of the Committee be enlarged to provide for an investigation and examination of all institutions, private and public, attempting or claiming to treat or cure narcotic drug addictions.

"Your Committee is convinced that this subject is of such vital importance to the people of the State of New York as to justify this procedure.

"Proper and humane treatment and cure should be provided for the addict by the State and necessary legislation enacted to prevent the spread of narcotic addiction.

"The testimony taken by your Committee shows that those charged with the sale and distribution of narcotic drugs are in the main observing the law, and that the legal distribution of these drugs is less than before the enactment of existing narcotic laws, both Federal and State.

"On the other hand it is apparent from this testimony that public consumption of narcotic drugs has increased to an alarming extent. The inevitable conclusion is that the unfortunate addict has been forced to and does obtain his supply illegally.

"This condition arises very largely from the fact that many physicians and pharmacists, either through misunderstanding of the law or the true nature of the addict's disease, have refused to prescribe or dispense narcotic drugs to the sufferer.

"Your Committee contends that any member of the medical or pharmaceutical professions who refuses either to prescribe or dispense narcotic drugs to the honest addict to alleviate the suffering and pain occasioned by lack of narcotics is not living up to the high standards of humanity and intelligence established by these great professions.

"In the opinion of your Committee, supplemental remedial legislation should be enacted at the present session of the Legislature with a view to further safeguarding the public from the ravages of narcotic drug addiction and providing means for a better check upon the narcotics dispensed in New York State.

"Such legislation should provide for a more complete record of narcotics distributed through legal mediums to the public in the form of a triplicate order blank upon which physicians, pharmacists, veterinarians and dentists shall obtain their supply of narcotics from manufacturers and jobbers.

"A definite form for these blanks should be established by the State Department of Health and the distribution of the said blanks should be under the authority of the said Department.

"Every physician, pharmacist, veterinarian or dentist ordering narcotics in quantity should be required to keep a copy on a form supplied, stating the amounts of the said drugs so ordered and the date when the order is entered.

"A copy of this official order blank should be forwarded to the manufacturer or jobber filling such order and another copy of the said order should be forwarded to the State Department of Health, at Albany, N. Y., for record in that Department.

"Regulations regarding the inventory and accounting of narcotic drugs should be as far as possible in accord with the provisions of the present so-called Harrison Law now on the statute books of the Federal Government, so that excessive clerical labor shall not fall upon the medical and pharmaceutical professions.

"Physicians and pharmacists, testifying before your Committee, have endorsed this recommendation as one that will help the administrative authorities of the municipal, county and State governments, to run down and prosecute malpractitioners who violate the ethics of their profession, the laws of the State, and the mandates of humanity by wilfully propagating and perpetuating narcotic drug addiction.

"Your Committee also recommends that means be provided for the gathering of statistics upon narcotic drug addiction in the State of New York and the registration of addicts with some central department of the State government for the purpose of not only recording these unfortunate persons, but of offering such advice as to rational treatment and cure as may be authentically brought to the attention of the State in the future.

"Serious objection has been raised to this procedure by members of the medical profession on the ground that such registration is in violation of the ethical standards of that profession and on the further ground that proprietors of unsound 'cures' for narcotic drug addiction and of so-called 'fake' sanitariums for the treatment of narcotic drug addiction would have access to the record recommended, and promote trade thereby at the expense of the addict.

"Your Committee recommends that the department of the State government instructed to file and keep such addiction records be also instructed to divulge its contents only to the proper authorities charged with enforcement of the law in the municipal county and State governments.

"It further submits that a record of narcotic drug addiction so kept would be of great value to the State in dispensing knowledge as to the true nature of addiction disease and in bringing to the attention of the addict any authentic and scientific formula, procedure or method of treatment for this disease that may be evolved in the future.

"Such record of addicts also would be of great value in properly administering the proposed drug supply recommended to be established by the State for the use of confirmed narcotic drug addicts in another part of this report.

"Having in mind the enlightened classification of narcotic drug addiction as a definite disease and not a vicious 'habit' that can be broken at will, brought to the attention of your Committee by eminent physicians, it is further recommended that the present laws providing for commitment of narcotic drug addicts to penal, correctional or charitable institutions be amended to also permit the commitment of said addicts to the care of a reputable physician who shall be found to be conducting his affairs in accordance with the laws of the State of New York and the established ethics of the medical profession, provided that the person so committed shall have at hand sufficient funds to defray the expense of such treatment.

"Your Committee submits that the illicit traffic in narcotic drugs, fostered by the absolute need of the addict for narcotics, is the greatest evil with which the commonwealth has to contend at the present time and that much illicit traffic presents a real and increasing danger of spread of the narcotic drug addiction disease to normal persons through the unlicensed and unregulated distribution of such drugs by irresponsible persons.

"Your Committee submits this illegal traffic in narcotic drugs is promoted by lack of uniformity in the public health laws of adjacent states and the Federal Government in relation to the regulation of sale, manufacture and distribution of narcotic drugs and that this lack of legislative uniformity is now a matter calling for the gravest consideration of the governing bodies of the various states of the union and of the Federal Government.

"Officials charged with the administration of the law in the State of New York and municipalities thereof have testified before your Committee that the absence of uniform federal and state statutes dealing with the great question of narcotic drug addiction and the manufacture, distribution and sale of narcotic drugs largely invalidates the statutes of this State and renders increasingly difficult the apprehension of illegal distributors who spread narcotic drug addiction by unlicensed distribution.

"It is recommended by your Committee, as a means of ameliorating this condition as far as possible by immediate legislation, that the present law be amended to include within its scope all persons, not duly licensed, physicians, veterinarians, dentists, or officials of private or public institutions charged with the treatment of disease, who shall aid or abet or assist in any way in procuring narcotic drugs other than through the regular channels for distribution established by the state, and that such person shall be guilty of a misdemeanor.

"It is further recommended by your Committee that the present law be amended to bring within its scope any person or persons who shall procure or attempt to procure narcotic drugs through false representation as a duly licensed physician, pharmacist, veterinarian, or dentist, or who shall forge a prescription or order for these drugs and that such a person shall be adjudged guilty of a felony.

"It has also been suggested to your Committee by various authorities in the State of New York charged with the enforcement of the law that the present law relating to the use, sale and distribution of the hypodermic syringe should be amended to require the issuance of a certificate to any person using such an implement and not a duly licensed physician, pharmacist, veterinarian, or registered nurse, which certificate shall entitle its holder to possession of the said hypodermic syringe for a period of time required for its legitimate use and the non-possession of which certificate shall make the possessor of the said hypodermic syringe amenable to prosecution under the law as it now is written upon the statute books of the State.

"Your Committee is prepared to draft legislation, and recommends the passage of such legislation by the State Legislature, embodying the points set forth in this report toward the end that laws may be enacted by the legislative body of the State of New York which shall, so far as possible, restrict the manufacture, sale and distribution of narcotic drugs in a manner that will prove beneficial to the moral and physical welfare of the people of the State of New York and also take into grave consideration the needs of the victim of narcotic drug addiction.

"Your Committee closes the report formulated upon its hearings held in the State of New York and cities thereof with reiteration of its opinion that constant use of narcotic drugs by an increasing minority of the people of this State is a matter so gravely important to the welfare of the commonwealth that it merits the most serious consideration of State legislators and officials whose duties include the promotion of moral and physical good health.

"A copy of the hearing held by your Committee is appended.

GEO. H. WHITNEY, Chairman,
GEO. R. BRENNAN,
R. M. PRANGEN,
JOHN J. BOYLAN,
MAURICE BLOCH,
Members of Assembly."

Following these investigations the first so-called Whitney Law was passed in 1917.

In general it resembled the Boylan Law but in the following provision differed therefrom:

It omitted chloral from the drugs included and covered only opium, its salts, alkaloids, derivatives, compounds, and preparations.

It also provided that if a prescription was for a person addicted to the use of these drugs, such prescription should contain a statement that it was issued in case of addiction.

It permitted a physician, after making a physical examination, to administer or prescribe for any person whom such examination showed to be addicted to the use of these drugs reasonable quantities dependent upon the condition of such person and his progress toward recovery, providing the physician acted in good faith solely for the purpose of relieving physical stress or of effecting a cure of such "habituate." Further it provided that the physician was obligated to assure himself that the person was thus seeking a means of relieving physical pain and not procuring or attempting to procure the drugs for illegal sale or distribution.

The law required the filing of one copy of an order for drugs with the state board of health at Albany, except in cities of the first class, in which case they were to be sent to the local board of health,—one by the person placing the order and one by the person making the sale.

It authorized dealers to file on July 10 of each year, with the state board of health, an inventory of their stock of drugs on hand as of July 1.

In cases where the person for whom the drug was dispensed or prescribed was an habitual user, the law required that a separate record of the prescription be made and that on the first day of each month physicians, hospitals, institutions, and sanitariums make reports to the state board of health of the name, age and residence of each such addict prescribed for, a copy of which was to be kept open for inspection by the proper authorities.

It prohibited veterinarians and dentists from prescribing, dispensing, or furnishing the drugs for treatment or consumption by human beings.

The law also provided that local boards of health could furnish without charge to a person found after physical examination to be addicted a prescription for such quantity of the drug as was deemed necessary in the opinion of the physician of the board of health to provide for the need of such person pending treatment.

On March 1, 1918, the Joint Legislative Committee above referred to transmitted its Final Report from which we quote as follows: [4]

> "In its report of last year the committee expressed certain opinions and conclusions as to the extent and effect of the drug evil.
>
> "Our investigation of this year has confirmed in the main the opinions and conclusions then expressed and it is therefore unnecessary to repeat them.
>
> "The time has come when the Legislature must determine whether the causes and existing conditions are such as the State, in the exercise of its legitimate

---

[4] Final Report of the Joint Legislative Committee Appointed to Investigate the Laws in Relation to the Distribution and Sale of Narcotic Drugs—State of New York No. 35. In Senate. March 1, 1918.

functions, can and should control and remedy by statute effectively enforced and if so, what means should be adopted to accomplish such purpose.

"It has been conclusively established to our satisfaction that drug addiction, however acquired, is not of itself a vice but is rather a disease and one which affects not alone the low and criminal but afflicts honest, intelligent people in all walks of life. Its effect is to sap the strength and vitality of the body, disarrange the functioning of its organs, and create a deplorable, diseased condition. When the drug is not furnished, its victim suffers the most horrible and excruciating pain from which he can obtain no relief except from a supply of the drug in accustomed quantity or a substituted medical treatment most intelligently and scientifically administered.

"It may not be the function of the State to cure disease, but it is the function of the State, so far as it can be reasonably done, to prevent the contraction and spread of disease and to furnish to the afflicted, within reasonable limits, such general public facilities as will aid in enabling them to obtain permanent relief.

"Estimates were given the committee by persons in position to be able to gauge conditions with a fair degree of accuracy that from two to five per cent of the entire population of the city of New York were victims of drug addiction. Reliable statistics obtained from police and other authorities and the evidence gathered by federal authorities and produced upon recent trials in the federal courts indicate that the disease is more prevalent and widespread in the smaller cities and rural communities than has been believed to be possible.

"When it is taken into account what this means in loss of money, loss of producing power, increase of crime and drains upon public and private charity to say nothing of its direct effect upon youth and society, from a business and economic point of view alone it would seem to be the part of sound common sense on the part of the State to endeavor systematically and effectively to prevent the spread of the disease and afford as far as practical all possible facilities for stamping it out.

"The drugs which are the sources of the difficulty are cocaine and eucaine with their salts and derivatives and opium and its derivatives, codeine, morphine and heroin. All have such unquestioned therapeutic value in the treatment of disease that their continued use is necessary. Both the state and national governments have endeavored to confine their use to proper channels by regulative and restrictive measures, but in this have been only partly successful. In some measures such failure seems to have resulted from well-intended but ineffective legislation, the history and effect of which it may be well to call briefly to your attention.

"Article eleven-a of the Public Health Law relating to opium and its derivatives by reason of continued amendment has become so complicated and verbose in language and covers such a mass of detail which should properly be left to departmental regulation that an intelligent construction of its provisions is almost impossible for an attorney and is impossible for a layman.

"Under it there is grave doubt whether a physician can dispense any of these drugs, and even their administration must be accompanied with so much record keeping and detail that few physicians will have anything to do with them. The federal statute permits them to be dispensed by a physician while absent from his office in personal attendance upon a patient without individual record and the failure of the state statute to permit this has proved to be a serious hardship particularly in the country districts where frequent calls daily are impossible.

"The multifarious record keeping and inability to understand the various statutory requirements have produced a like effect upon the apothecary. Like the physicians very few apothecaries will dispense any of these drugs where a separate record or certificate or label is required and then only at extortionate prices, the excuse being given that with the various statutory requirements some of which are conflicting and many of which they do not understand they cannot afford for any reasonable compensation to take a chance of getting into trouble.

"No fixed policy exists for the enforcement of the State statutes except in the larger cities of the State but their enforcement has been left to the desultory or spasmodic efforts of local police officials who have come to look upon every person addicted to the use of narcotic drugs, not as a person afflicted with disease, but as one who is a degenerate or a criminal. The most intelligent enforcing agency has been the federal internal revenue department which has now become so engrossed with handling conditions growing out of the war that it will for some time be unable to give the matter the attention which it otherwise would. As a result, the use of these narcotic drugs is on the increase and the traffic in them has been driven into the hands of the peddlers and unscrupulous apothecaries and physicians who have commercially exploited their victims to the last extremity.

"The testimony adduced before the committee indicates that the treatment employed in many private sanitaria advertising to cure drug addiction has been ineffectual. If only a small part of the evidence on this subject be true, the need of some supervision of these institutions is apparent.

"Certainly these conditions cannot be permitted to continue. If the conditions are as serious as the facts presented to us seem to clearly indicate it is the duty of the Legislature to enact one statute covering the whole subject clear and concise in terms, easily understood, in harmony with the federal statute, elastic in application, to be enforced by a central state authority adequately supported and equipped to effectively cooperate with the federal authorities and with a fixed policy along definite lines. It should make every possible effort to stop the growth of drug addiction as well as to reduce it to such an extent as medical science stimulated and encouraged and intelligently applied will render possible.

"To accomplish this purpose we recommend the creation within the State Department of Health of a department of drug control at the head of which shall be a commissioner with such administrative force only as will enable him to effect an organization which can conveniently cooperate with the federal internal revenue department in the several internal revenue districts within the State and utilize so far as possible information obtained by the federal inspectors and agents without expense to the State; that the commissioner have discretionary power to make such needful rules, regulations, rulings and decisions from time to time, not inconsistent with the statute, as may be necessary to meet changing conditions and the rulings and decisions of the internal revenue department, thus giving to the statute elasticity in detail administration which seems to be absolutely essential for its intelligent and practical enforcement; that the commissioner should have power to obtain data and information relative to drug addiction and the means by which it can be controlled, reduced or eliminated for the information and assistance of the medical profession as well as the public generally.

"That comformably with the federal system all persons who manufacture, distribute or dispense cocaine or opium or its derivatives should be required to register annually with the department upon the payment of a nominal fee so that the commissioner may have a record of those who purpose to handle the drugs.

"That all of such drugs purchased should be ordered upon official order blanks one of which should be filed with the department and all of such drugs prescribed for or dispensed to those suffering from drug addiction should be upon official blanks, one of which should be filed with the department.

"That pharmacists, druggists, physicians, dentists, veterinarians and hospitals and institutions for the treatment of disease should be required to keep only such records as are required to be kept under the Harrison Law and make such reports as the commissioner may require to enable him to determine whether or not the purpose and intent of the statute is being fully complied with; that private hospitals, sanitoriums and institutions maintained or conducted in whole or in part for the treatment of inebriety or drug addiction be required to procure a certificate of authority from the department; that the provisions of the present statute restricting the possession of the hypodermic syringe and relating to commitment of persons suffering from drug addiction to public hospitals and institutions for the treatment of disease be retained; and that the penalty imposed for a violation of any of the provisions of the statute be made a misdemeanor.

"We have formulated and will shortly present a proposed bill covering these recommendations and will respectfully submit it for your consideration.

"The committee further recommends that as soon as the financial condition of the State will permit it provide at State expense an institution or institutions for the treatment of drug addiction where a scientific study can be made and information obtained as to the most effective remedies and methods to be employed and utilized in such treatment.

"We again urge upon the medical profession the necessity of a more thorough study of drug addiction as a disease and of the scientific methods to be employed in its treatment, which is essentially a problem to be solved by the physicians and not by the Legislature.

"We fully appreciate the importance and gravity of the subject of our investigation and sincerely hope that as a result of our efforts lasting good may be effected.

"All of which is respectfully submitted.

George H. Whitney, *Chairman*
John J. Boylan
Richard M. Prangen
Maurice Bloch
Geo. R. Brennan.

Dated, at the Capitol. Albany, N. Y.
February 28, 1918"

Following the completion of the second Joint Legislative Investigation, the so-called second Whitney Act was passed and became a law May 13, 1918. The points of difference between this and the former Whitney law were the following:

This law provided for a department of narcotic control, the head to be the Commissioner of Narcotic Drug Control, appointed by the governor with the consent of the senate for a term of six years. The following covers the duties and powers of the commissioner as set forth in the law:

> "The commissioner is hereby empowered to make all needful or helpful rules, regulations, rulings and decisions which in his judgment may be necessary or proper to supplement or effectuate the purposes and intent of this article or to interpret or clarify its provisions or to provide the procedure or detail requisite in his judgment to effectually secure the proper enforcement of its provisions, which rules, regulations, rulings and decisions, when made and promulgated by the commissioner, shall become rules, regulations, rulings and decisions of the department, and until modified or rescinded shall have all of the force and effect of statute. The commissioner may divide the state into not to exceed four districts and maintain a branch administrative office in each, except that in which the capitol is located. It shall be the duty of the commissioner to enforce the provisions of this article and all the rules, regulations, rulings and decisions of the department. The commissioner may for cause deemed by him to be sufficient, after having given reasonable notice and opportunity to be heard, revoke any certificate of authority issued by the department and revoke, cancel or withhold official blanks issued or applied for. The commissioner shall obtain data and information relative to the extent of drug addiction and the means by which it can be controlled, reduced or eliminated and the means and methods used in its treatment. He shall have the power to inspect and examine any hospital, sanatorium, institution or place in which persons are treated for drug addiction. He shall report annually to the legislature with such recommendations as he may deem warranted. The commissioner and each of his deputies shall have the power to administer oaths, compel the attendance of witnesses, the production of books and papers and to take proof and testimony concerning all matters within the jurisdiction of the department and in such connection no communication made to a physician shall be deemed confidential. The commissioner shall fix the prices to be paid for blanks procured from the department and the fees, not specifically fixed herein, to be paid upon the issuance of any certificate of authority to be issued by the department."

The law further provided for the appointment of three deputy commissioners by the commissioner, each of whom was vested with the same powers as the commissioner within the territorial district to which he might be assigned, except the power of appointment to position, the power to grant and revoke certificates of authority, and the power of making and promulgating rules, regulations, rulings and decisions.

The drugs included in the law were cocain, opium, morphin, codein, heroin and any compound, manufacture, salt, derivative, or preparation thereof including alpha or beta eucain, or any of their salts or any synthetic compound of any of them, excepting decocainized coca leaves or preparations made therefrom which did not contain cocain. The possession, sale, distribution, administration, or "dispensation" of the foregoing drugs, except as expressly and specifically authorized by the provisions of the law, was declared to be dangerous to the public health and a menace to the public welfare.

The law further required that manufacturers, wholesalers, apothecaries, physicians, dentists, veterinarians, or private hospitals, sanatoria, or institutions maintained or conducted in whole or in part for the treatment of disability, disease, inebriety, or drug addiction should register with the department their place of residence and place of business and receive from the department a certificate authorizing them to carry on such business.

Those authorized to possess or otherwise handle the proscribed drugs were required to order them on serially numbered, triplicate blanks which were procurable from the Department of Narcotic Drug Control, one copy to be retained by the person ordering, one by the person filling the order, and the third to be sent to the department.

Apothecaries were authorized to fill prescriptions written upon unofficial prescription blanks when properly made out, providing such prescriptions did not contain more than 5 grains of cocain, 30 grains of opium, 6 grains of codein, 4 grains of morphin or 2 grains of heroin and also upon a like prescription, i.e., unofficial, if it contained any of such drugs in excess of said respective quantities, if it stated upon the prescription that it was to be used in the treatment of a surgical case or disease other than drug addiction. Apothecaries could also dispense these drugs in excess of the quantities above mentioned if the prescription was written upon a serially numbered official prescription delivered to him in duplicate provided he kept one of said duplicates for a period of 2 years and mailed the other within twenty-four hours to the department.

Physicians were authorized "in the course of the legitimate practice in good faith" of their profession and to relieve or prevent pain or suffering, or to effect a cure, to administer, prescribe, or dispense cocain or opium in such amounts and upon such prescription forms as indicated above could be filled by apothecaries. Further, physicians were authorized to administer or dispense to patients under treatment not to exceed 2 grains of cocain, 15 grains of opium, 3 grains of codein, 2 grains of morphin or ¼ grain heroin.

Also while absent from their offices in personal attendance upon patients physicians were authorized to dispense, to be taken in their absence, the amounts of the proscribed drugs listed in the preceding paragraph.

For any other administration or dispensing of these drugs physicians were required to record in writing upon a serially numbered official dispensing blank in duplicate to be procured from the department, the name and quantity of the drug and the form in which administered or dispensed, the original of such dispensing blank to be kept on file for two years and one copy to be mailed to the department within twenty-four hours.

The law provided that the provisions of the foregoing section relating to the conditions under which unofficial and official prescription and dispensing blanks could be used were, to the department, directory only and could by rule or regulation of the department be changed to meet existing conditions.

The law provided that hospitals, sanatoria, or other institutions, federal state or private, in which persons were treated for disease or disability other than drug addiction or for inebriety or drug addiction and which had unrevoked certificates of authority issued by the department, under the supervision of a physician, could administer cocain or opium to inmates who were under treatment as patients.

No manufacturer, wholesaler, apothecary, physician, dentist, or veterinarian could possess or obtain the proscribed drugs except for the conduct of a lawful business or in the legitimate conduct or practice in good faith of his business or profession.

The law required that only physicians, dealers, apothecaries, dentists, veterinarians, or nurses or internes of a hospital or sanatorium or institution in which persons were treated for disability or disease could at any time possess a hypodermic syringe or needle unless such possession was authorized by a physician's certificate issued within one year.

The law provided for an even more comprehensive system of recording by those concerned with the handling of the drugs in question than did any of the former laws.

Seized, confiscated, or surrendered drugs were to be disposed of by the commissioner.

All records, papers, information, statements, and data acquired by the department were to be regarded as confidential and not open to inspection by the public or any one other than the official custodian or such persons as might be authorized by law or by the commissioner.

The law declared "the habitual use of cocain, opium, or its derivatives, except as administered, prescribed or dispensed by a physician," to be dangerous to the public health and safety and provided that upon a complaint made to any magistrate that a person was so addicted or upon the voluntary application to him of an addict, the magistrate, if satisfied of the truth thereof, might commit such person to a state, county, or city hospital or institution licensed under the Lunacy Commission or any correctional or charitable institution maintained by the state or any political subdivision thereof or private hospital, sanatorium, or institution having an unrevoked certificate of authority from the department for the treatment of disease or inebriety. Such committed cases were to be released when the chief medical officer of the institution should certify to the magistrate that they had been sufficiently treated or when, for any other reason, it was deemed adequate or sufficient by the magistrate.

It was provided further that any public hospital, sanatorium, or institution might accept as a charity patient any person voluntarily applying for treatment for drug addiction if the applicant signed a statement that he desired treatment in the same manner and subject to the same rules and restrictions as if committed by a magistrate, and without formal commitment, with like effect as if formally committed subject to discharge when sufficiently treated or for other reason. Such commitment might also be had upon the application of the commissioner or any local health board or officer. These provisions of the law were not intended to restrict the right of any hospital, sanatorium, or institution to treat cases of drug addiction at other than public expense.

As to fraud or deceit the law stated:

> "Any fraud, deceit, misrepresentation, subterfuge, concealment of a material fact or the use of a false name or the giving of a false address in obtaining treatment in the course of which cocaine or opium or its derivatives in excess of

> lawful quantity shall be prescribed or dispensed or in obtaining any supply of such drugs shall constitute a violation of the provisions of this article. For the enforcement of the provisions of this article statements, representations or acts herein referred to shall not be privileged as confidential communications."

Licenses could be revoked as provided in the following:

> "Any license heretofore issued to any physician, dentist, veterinarian, pharmacist, druggist or registered nurse may be revoked or suspended by the proper officers or boards having power to issue licenses to any of the foregoing upon proof that the licensee is addicted to the use of any habit-forming drug or drugs after giving such licensee reasonable notice and opportunity to be heard. Whenever it shall appear that such licensee has fully recovered and is no longer an addict to any of such drugs, such board may grant a rehearing and in its discretion reissue or reinstate the license of such licensee. Whenever any pharmacist, druggist, physician, dentist, veterinarian or registered nurse shall have been convicted of the violation of any of the provisions of this article, any officer or board having power to issue licenses to any such physician, dentist, veterinarian, pharmacist, druggist or registered nurse may, after giving such licensee reasonable notice and opportunity to be heard, suspend or revoke the same."

In any complaint, writ, or indictment laid or brought under or for the enforcement of any of the provisions of the law it was declared not to be necessary to negative an exception or exemption and the burden of proof was placed upon the defendant or person proceeded against to establish affirmatively any exception for exemption claimed.

Regulations

Pursuant to the authority conferred by the second Whitney law, the commissioner of narcotic drug control issued, from time to time, rules and regulations for the administration of the department. The following is a digest of the regulations revised as of December 27, 1920, insofar as they related to the practice of medicine and the handling of cases of chronic opium intoxication:

One regulation required the pharmacist filling a prescription issued on the triplicate prescription blanks to endorse on the face of the original and the duplicate the date of filling, file number, his name and business address, and the name of the person to whom the prescription was delivered, if other than the person for whom it was issued.

A "drug addict" was defined in the regulations as follows:

> "Any person who has needed or demanded the administering, prescribing for, dispensing of cocaine, opium or their derivatives at more or less regular intervals for thirty consecutive days prior to the time such person applies to a physician or a physician of any institution for the administering, prescribing for or dispensing of any such drugs or their derivatives; provided, however, that upon

the filing of the report of the case by the attending physician or the physician of any institution in charge of the patient, with this Department, it may rule that such person shall or shall not be recorded."

Examination prior to undertaking the treatment of cases of chronic opium intoxication was required in the following language:

"A physician or a physician of any institution before beginning the treatment of a person for drug addiction must make a thorough physical examination of such person, and such other examination as is necessary to satisfy him that the patient is addicted to the use of cocaine, opium or their derivatives. The physician or the physician of the institution must keep on file a statement of his examination with the name of the patient, his address and the date of the examination."

The reporting of cases of chronic opium intoxication was required as follows:

"A physician or physician of any institution prescribing for, administering or dispensing cocaine, opium or their derivatives daily for more than thirty days to a patient shall register with this Department or its authorized agent, the name of such persons, together with a statement of the physical or mental condition of such person and a prognosis as to the probable future necessity for continuing the prescribing, administering or dispensing of cocaine, opium, or their derivatives to such patient; such prognosis shall include an estimate as to the length of time which, according to the judgment of the registered physician or the physician of any institution will be required to remove the necessity of administering the aforesaid narcotic drugs to such patient."

The reporting of "probable addicts" was also required as follows:

"A physician or physician of any institution is expected to cooperate with the Department of Narcotic Drug Control and is required to register within forty-eight (48) hours, with said Department, the name, address, physical and mental condition, and any necessary circumstantial information regarding any person who applies for professional treatment, and whom the physician or the physician of the institution thinks is an addict."

One regulation altered the provisions of the law as follows:

"A physician or physician of any institution issuing a prescription for, administering or dispensing cocaine, opium or their derivatives in any quantity whatsoever, whether for a drug addict or any other patient, shall only do so upon the official triplicate prescription blank or the official duplicate dispensing blank.

"An apothecary must not dispense cocaine, opium or their derivatives on any prescription, unless it is written on the official triplicate prescription blank.

"All provisions of law and all regulations applying to the filing of official prescription blanks and official dispensing blanks shall apply to such blanks used pursuant to this regulation."

The law as relating to the prescribing of the named drugs was interpreted as follows in the regulations:

"The first paragraph of subdivision 5 of Section 427 of Article XXII, Chapter 639 of the Public Health Law reading: 'A physician may, in the course of the legitimate practice in good faith of his profession and for the purpose of relieving or preventing pain or suffering on the part of the patient, or to effect a cure, adminster, prescribe or dispense cocaine or opium or their derivatives as follows:' shall be interpreted to mean that where a physician or a physician of any institution prescribes for, administers or dispenses opium, cocaine or any of their derivatives to an habitual user thereof, such prescribing for, dispensing or administering, not being issued in the course of professional treatment in the attempted cure of the addiction, or for relief in the treatment of any other disease or surgical operation, but being used for the purpose of providing that addict with the aforesaid drug or drugs sufficient to keep him comfortable, will be considered by the Department as a perversion of the meaning of the words 'good faith' contained in said subdivision."

The regulations further stated:

"While opium, cocaine or their derivatives may legitimately be used in connection with or as part of the treatment for the cure of addiction, the prescribing for, administering or dispensing of such drugs to an addict for self-administration by such patient shall not be deemed to constitute in itself legitimate medical treatment for the cure of such addiction, unless the physician purposes either by a gradual reduction in the dose or by some other method of treatment to effect within a reasonable limit of time a cure of the addict."

Also referring to the handling of cases of chronic opium intoxication the regulations provided:

"A physician or a physician of an institution issuing a prescription for, administering or dispensing cocaine, opium or their derivatives to a drug addict in any quantity whatsoever, shall ascertain, if possible, the date of the last dosage given to the addict, the amount of the dosage, the name of the physician who prescribed, administered or dispensed it, and insert such information on the official blank used."

In addition to the Whitney law and its regulations, we find in the Second Annual Report of the Narcotic Drug Control Commission,[5] the following account of a control measure:

"In an attempt to prevent the addict from receiving drug through more than one doctor, the New York City Health Department, in cooperation with the State Department of Narcotic Drug Control, experimented with an administrative procedure designed to make it impossible for the addict to secure drug more than once a day. Every addict was required to be registered. When he presented himself at the clinic, he was physically examined by a physician. after which he received a dosage card which contained his name, his address, his age, the usual amount of drug he had been accustomed to taking, and his picture. Every time the doctor prescribed for an addict, he was required to sign a designated blank space on the dosage sheet for that day, and the apothecary, likewise, when filling the prescription. It was hoped that the addict would not receive more than one prescription for that day because the next doctor or apothecary would see that the spaces on the calendar dosage card for that day had already been signed, and therefore would not violate the law. Over 7,500 addicts were thus registered."

---

[5] Second Annual Report of the Narcotic Drug Control Commission. April 15, 1920.

No comment as to the success or failure of this method of registration is made in the report.

In 1921 the New York State legislature repealed the second Whitney law and New York had no state anti-narcotic law in operation, although a number were presented for passage, until 1927 when the legislature passed a law which in general followed the provisions of the Harrison Narcotic Act. In addition, it contains the following features:

A physical examination is required to be made by physicians, dentists, and veterinary surgeons before the administration, dispensing, or prescribing of "any habit-forming drugs." Instruments for the injection of habit-forming drugs may not be possessed except by professional groups or upon the order of a physician. Notice of conviction of professional men "for wilful violation" of the law is required to be sent by the clerk of the court or by the magistrate to the department, board or officer having power to suspend or revoke the license of the person convicted. Provision is made for the commitment by a magistrate upon the voluntary application to him of any habitual user of any habit-forming drug to any hospital or charitable institution maintained in whole or in part by the state or any political subdivision thereof which is willing to receive such addict.

Sufficient time has not yet passed to permit of an evaluation of the merits of this law.

New Orleans Clinic:

Another state, Louisiana, undertook by a supplementary activity to provide for certain emergencies arising out of the operation of its anti-narcotic law and in 1919 there was opened in New Orleans by Dr. M. W. Swords with the authority of the state board of health a clinic or dispensary where an effort was made to handle cases of chronic opium intoxication in a practical manner. The following quotation describes the operation of the clinic: [6]

> "Narcotic laws in vogue being apparently defective in controlling the drug traffic and narcotic addiction, the State of Louisiana recently enacted a new State Narcotic Law, directed towards the better control and regulation of said drug traffic, particularly thru its principal offenders, the 'trafficker,' 'vendor,' 'morphine doctor' and 'dope apothecary.' This legislation created a drug 'panic' in addict circles, causing drug 'vendors' to cease their activities temporarily, by cutting off the main source of drug supplies. In desperation, addicts applied to the Louisiana State Board of Health for relief, the only place where they could have reasonable assurance of assistance.
>
> "It was apparent, after reflection, that in the passage of this anti-narcotic law, the addict, the principal one affected, had been overlooked. His unfortunate plight had not been sufficiently considered, and the possible results of the law not intelligently comprehended. The Louisiana State Board of Health came to the conclusion that addicted humans were deserving of consideration and care, as well as those unfortunates afflicted with other diseases, and a remedy was sought to meet the occasion.
>
> "Neither the State nor Board was financially able to care, even temporarily, for these sick people. It was expedient that immediate means must be had by which a grave condition could be met. It was decided, therefore, to supply addicts with their drug at cost price, plus a sufficient margin to meet expenses incidental to the operation of the dispensary.
>
> "It was found that opium (and its derivatives) was the one drug of physiologic necessity insofar as addiction is concerned. Consequently, it was decided that morphine, the principal opium derivative, should be the only drug dispensed.
>
> "The Narcotic Dispensary having been established, other questions presented themselves, the most important of which was 'Why so many addicts?' and 'Whence the enormous supply of drugs?' It was found that the main supply was thru 'drug traffickers,' made up of irresponsible 'vendors,' 'unscrupulous apothecaries' and 'morphine doctors.' Knowing the supply, the natural question was 'How to combat it?' Laws being ineffective, it was determined that some rational means be established to strike at the heart of this nefarious evil.
>
> "Legitimate supply seemed to be the most logical plan that presented itself. To meet the illegitimate vendor and prescriber of drugs on a common ground the narcotic Dispensary supplied addicts in a legitimate way at a price so low that the vendor would not take chances of falling into the hands of the law for the small profits brought about by this new form of competition. The effect of this modus operandi was apparent. The vendors of drugs utilized their wits unsuccessfully in attempting to combat a practical demonstration of legitimate supply, with the result that their activities became noticeably less, many of them being forced to seek more profitable sources of revenue.
>
> "Cause and effect, profit and supply are the basic principles that must be met in the solution of the drug problem.

---

[6] Swords, M. W.—A résumé of Facts and Deductions obtained by the Operation of a Narcotic Dispensary—American Medicine—January 1920. p. 23.

"What is the cause? The medical and allied professions, environment of the 'tenderloin,' and association are the principal causes.

"What is the effect? The addiction of people to a drug, opium, or its derivatives, causing what heretofore has been known as a 'habit,' but what in reality is a physiologic changing of the proper functioning of every organ and tissue, creating the pathologic mechanism of a definite 'disease,' characteristic in its symptomatology and pathology and which cannot be combated except by scientifically adapted measures. Drug addiction, as applied to opium, and its derivatives, is a disease and not a human frailty, and must be recognized as such before any rational solution of the problem can be understood and any treatment successfully directed towards its cure and eradiction.

"What is the supply? Doctors, hospitals and the underworld, thru illegitimate vendors.

"What actuates this practice? Millions of dollars each year spent by men and women which go into the coffers of the 'man higher up,' who directs the business and is the real recipient of this enormous profit.

"How to combat it? By furnishing a legitimate supply. Addicts are not necessary, but are with us; their addiction-disease is a part of themselves, a condition eternally demanding relief. A legitimate source of supply should be provided at a price so low that the illegitimate vendors must meet it or go out of business. Legitimate supply is the basic principle on which this Narcotic Dispensary is combating the drug evil. It will take time and education to effect perfect results. Necessarily there are other scientific problems for solution. The first is to extricate the poorer addict from his unwholesome surroundings. This we have attempted to do by establishing a dispensary that in appearance and respectability inspires dignity and confidence."

* * * * *

"Our Medical Clinic is equipped for determining any physical disability or illness of its clientele. This clinic has in attendance two doctors and a trained nurse. Histories are taken and filed, covering past and present condition of patients, together with statements of physical irregularities. Each addict is examined to establish primarily whether he or she is an addict, the cause of addiction and every other detail pertinent to the physical and mental condition. In our Dispensary we endeavor to practice the highest type of medicine.

Objects of the Dispensary

"1. We realize that a permanent cure of those afflicted with drug addiction-disease is impossible, in the great majority of cases, unless the addict be placed in a position to secure scientific treatment. The sole object of this dispensary is to relieve suffering until such time as a scientific treatment may be had.

"2. The basis of operation is legitimate supply versus illegitimate trafficking.

"3. To prevent a victimized people from being more thoroly victimized by heartless, profiteering 'ghouls.' To prevent the making of new addicts.

"4. Diminishing petty thievery which constitutes a tax, or burden, on society, for the reason that many addicts, unable to pay the price of $1.00 or $3.00 per grain, are forced to criminal methods.

"In the operation of this Dispensary, we have refrained from 'registration' of addicts, compulsory hospitalization and police interference, all of which would intimidate the addict and drive him back to the underworld supply, and thus defeat our primary purpose. We have no 'registration' to compromise addicts or subject them to possible blackmail. Their secret is guarded in strict confidence. We work in harmony with officials, but not to the extent of betraying confidences.

Treatments

"This Dispensary does not attempt to cure addicts, realizing that this is a problem that can only be solved when addiction-disease is better understood. We are establishing, however, in connection with our Dispensary, a 'research laboratory' with the hope that ultimately this may lead to some scientific means by which cures may be effected.

"Much has been written regarding addiction that has been actuated by mercenary interests. Facts regarding morphinism are known to but few. The literature is filled with various 'treatments,' a few only by scientific men who have a conception of drug addiction-disease and what it means.

"The 'reduction' treatment is much discussed. In our opinion, it is a fallacy, pure and simple. The 'hot shot' and other forms of treatment are empirical and not based on scientific knowledge. Some are effective, no doubt, in individual cases, but this obtains only in isolated cases and must not be confused with the entire problem of addiction-disease.

"The 'forcible reduction' treatment will do more harm than good and is worse than no treatment at all. . . ."

* * * * *

"The Dispensary has accomplished the following: Temporary relief of addicts at minimum cost. No new recruits thru this Dispensary. Petty thievery diminished among the lower class of addicts. We have made economic assets of many who formerly were human derelicts. We have made many happy mothers and children by enabling fathers and husbands to keep honestly employed. We have raised the morale of addicts to the extent that they no longer will to steal, since the actuating motive has been removed. We have concentrated and segregated the principal offenders in petty crime. We have surrounded the high-type addicts with security and protection. All addicts are known and if any are 'wrong-doers,' they are apprehended. This instils a fear of crime and results in good behavior. The addicts have come to know the Dispensary as their best friend where the hand of sympathy and understanding is held out to them. All of this has been accomplished at no cost to State or Board of Health. Our fight has been hard, due to the ignorance of laity and medical profession as well."

As stated in the article above quoted the clinic was opened as an emergency measure and its operation continued upon the advice of Judge A. V. Coco, Attorney General of the state of Louisiana, whose opinion is abstracted as follows from a report of Dr. Swords as an excerpt from the minutes of the Louisiana State Board of Health.

"Excerpt From Minutes of La. State Board of Health:

Meeting held on Feby. 20-21, 1919: . . . Attorney General Coco was asked what should be the procedure of the Board towards supplying narcotics to drug addicts. The Attorney General was informed that Dr. Swords, Secretary of the Board, had, during the absence of the Board's President, furnished addicts who had applied to the Board with narcotics, and his opinion was asked as to the wisdom of such a procedure, as well as the possible legal aspect of same. The Attorney General's answer was to the effect that Dr. Swords had acted perfectly well and within the law, that the intent of the law was plain and that it was not only humane and commendable for the Board of Health to attempt to care for the present addicts under existing circumstances, but from a legal point of view it was incumbent on the Board to make provision, temporary or permanent, to care for and relieve those suffering with habitual drug use, protecting society and property by so doing. The Attorney General was asked the direct question by Doctor Dowling, President, if the State Board of Health, on account of the gravity and seriousness of the situation, could charge addicts for habit-forming drugs, and could the Board dispense such a drug, or drugs, without violating the law, it being explained that the necessary funds were not otherwise available to procure drugs for these addicts, and that said drugs could not be furnished them by any other known means. The Attorney General stated that the Board had a perfect right to dispense drugs to addicts, and that there was nothing in the law preventing the Board from charging said addicts for drugs obtained. He said that addicts, in applying to the Board for relief, were applying to the only source where they had a right to expect aid and assistance to lessen their misery and suffering. That he, as Attorney General, heartily approved of what had been done, and further stated that it was absolutely up to the Board of Health and State to take care of the situation."

The written opinion of assistant Attorney General Robertson, according to Dr. Sword's report, was read into the Minutes of the Board as follows:

"Doctor Oscar Dowling, President,
Louisiana State Board of Health,
New Orleans, Louisiana.

Dear Doctor:

"The Attorney General has referred to me your letter of even date requesting an opinion as to the authority of your Board and the various health officials of the State to provide for the treatment of drug addicts. In reply, I beg to advise that Act 157, of 1894, provides for the treatment and cure of such persons where a petition is filed in the District Court having jurisdiction over the addict by any kinsman or friend. The person to be treated must consent to the petition and agree to take the treatment. Section 2, of this Act, limits the expense of said treatment to the sum of $100.00, payable out of the funds of the Parish in which the addict is domiciled. The constitutionality of this act was upheld by the Louisiana Supreme Court in Webster vs. Police Jury, 51 La. An.

1204. While the expense is limited to $100.00 for each commitment, if the party be not cured at the expiration of the term paid for by said sum, I know of no law which would prevent a second petition being filed with the court, and an additional course of treatment given thereunder. Section 19 of Act 252, of 1918, (the narcotic law) provides for like treatment of drug addicts at public expense, but does not limit the amount. This section also stipulates that said treatment must be given on voluntary application of the patient. Both laws provide that the treatment be in some hospital or institution in the State. I note that you say that drug addicts are regarded by the medical profession as 'sick persons.' Act 42, of 1880, requires Police Juries to make provision for the support of all indigent, sick, infirm or disabled paupers residing in their respective Parishes. In speaking of this Act, the Supreme Court in 'State vs. City of New Orleans,' 50 La. An. p. 890, said:

" 'There can be no question as to the duties of cities to support their indigent sick, disabled and infirm persons within their borders; but the question is how and under what circumstances and conditions are they to do so. Had the city built or leased premises having this object in view, and placed employes over them, and made provision through its ordinances for the payment of expenses incurred in so doing, no one, we suppose, would question the validity of such ordinances, by reason of a want of authority in the city to pass them.'

"This office is, therefore, of the opinion that your Board and the local health authorities throughout the State, have the legal right to petition the Court to have drug addicts placed in the various hospitals and institutions in this State for cure and treatment. However, the laws quoted above refer to cases in which the addict willingly consents to said treatment, and a different question arises where the addict refuses to avail himself of their provisions. In such cases, and where the addict becomes deranged or partially deranged through excessive use of drugs, and is dangerous to be at large, your Board, and the local health authorities, may have the parties so addicted taken in custody by the Sheriff, and on petition by the District Attorney of his District, and a Commission composed of two reputable physicians and the Court may be appointed to inquire into his mental condition, and if adjudged insane by reason of excessive use of drugs, the court may order him to one of the Louisiana hospitals for the insane for treatment and care. The person so interdicted is transported at the expense of the Parish where he is living, and the cost of his treatment and cure is paid by the State, unless the patient, or the husband or wife, is able to pay for same. In that case, the District Attorney may bring suit to recover the amount so expended on his treatment at said hospital. See Act 68, of 1918. Trusting I have answered your query, I am, Very respectfully yours,

(Signed) Thos. W. Robertson,
Assistant to Attorney General."

After this clinic had been in operation for about two years it was closed, according to Dr. Swords, because of the persistent requests of Government officials.

CHAPTER XIII

CONTROL (*continued*)—MUNICIPAL

In addition to the efforts made by the states reviewed above, certain municipalities have passed laws and instituted from time to time other activities directed at the control of this problem. For the most part, these took the form of prohibitory laws similar in tenor to the state laws and hence do not require reviewing here.

Jacksonville, Florida.

In 1912, however, a different type of activity was undertaken in Jacksonville, Florida, in an effort to determine and lessen the chronic use of opium derivatives. The provisions of this local law have been outlined in a previous chapter and it is only necessary here to note its effect in regulating and controlling the distribution of certain drugs. Prior to the passage of this ordinance the only legislation dealing with the sale and distribution of opium and its derivatives was the state pharmacy law—in reality a poison law—and this law for years had been a dead letter. As a result it was a common practice for pharmacists to make counter-sales of opium preparations and to justify such sales by stating that indigent users could not afford to pay a physician for a prescription and then the druggist for the filling of it. The new law, through a provision that permitted the city health officer or any other medical officer of the health department to furnish free of charge prescriptions for these drugs to those unable to pay for them, eliminated the temptation and excuse for counter sales and in a very brief space of time such sales ceased entirely. It is of further interest and importance that the price of morphin at this period was so low—about sixty cents a drachm—that competition by peddlers could not be lucrative.

During the operation of this ordinance such peddling as existed was confined to one or two individuals who, as a matter of convenience, supplied certain customers in the restricted district who for reasons of their own preferred to pay the additional price than to come to the health department at, to them, inconvenient hours. Aside from this there was no illegal traffic.

When, however, the Harrison Narcotic Act was passed in 1914, the city clinic was discontinued. Those patients who were willing to take treatment were cared for at a general hospital and the giving of free prescriptions was discontinued entirely. This left a considerable number of individuals who had not taken treatment as well as many who after treatment reverted to the use of their drugs. Immediately an illicit traffic sprang up, the price of the drug soared although the retail price in the drug stores remained the same, and ever since this period peddling has been as rife and as profitable in Jacksonville as elsewhere.

New York City.

In April 1919 the Department of Health of the City of New York, under authorization from the State Department of Narcotic Drug Control, established a narcotic clinic. The reasons for the opening of this clinic and the objects sought are set forth in the following article by the commissioner of health, Dr. Royal S. Copeland: [1]

> "Within a few hours after the closing of their ordinary sources of drug supply, hundreds of addicts were clamoring for treatment. The doctors who had been growing rich in this traffic were frightened, and the poor victims had no means of relief. On April 10th, the New York City Health Department opened a Clinic for the temporary care of these patients. This is still in operation and up to this time more than seven thousand persons have applied there for treatment.
>
> "The original intention in the establishment of this Clinic was to meet the urgent emergency of last April. It is now a clearing house, or admission bureau, preparing the way for the hospital treatment of the patient. Without absolute control of the patient and his complete isolation from clandestine sources of supply, there is no hope of cure. Ambulatory treatment is foreordained to failure so long as there are secret and illegal methods of obtaining the drug. Under present conditions, therefore, it is my belief it will be a very rare instance indeed when a patient is cured outside a hospital, or in the absence of equally well controlled conditions within a private house. So farreaching is the influence of this evil that no trust can be placed in persons not absolutely proof against cajolery and bribery, or in any surroundings not impregnable against assault. The cunning and ingenuity of the evil genius presiding over this practice are almost beyond belief.
>
> "The Clinic has served a humanitarian purpose in that it has provided a place for a careful physical examination, advice as to needed medical treatment for fundamental conditions, and careful oversight of the progress of the drug

---

[1] Copeland, R. S.—The Narcotic Drug Evil and the New York City Health Department American Medicine. January, 1920. pp. 17-23.

disease. It has saved the addict from the victimizing methods of the doctor who heretofore has exploited the drug patients by charging excessive fees for bogus 'treatment', and of the druggist who has wickedly profiteered on the drug and not infrequently given short weight besides. Attendance at the Clinic has given the Health Department time and opportunity for study of the home surroundings, personal characteristics, and reliability of the patients.

"The gradual but consistent reduction of the daily dosage at the Clinic has shortened the period of the necessary hospital treatment. Likewise, it has increased the value of residence in hospital by sending patients in much better physical condition to begin with than would otherwise be the case. The Clinic has given us a hold on hundreds of addicts who, without it, would be lost to the municipal authorities, and, lastly it has made possible a steady flow of patients to the hospital, thus justifying its necessarily large personnel, and in every way facilitating the problems of hospital administration.

"We come now to a consideration of the important feature of our program, the hospital care of the addict. It may be recalled that the Commissioner of Health had great difficulty in finding a hospital for these unfortunates. Public opinion had to be moulded and official consent gained, but finally Riverside Hospital, on North Brother Island, was set aside by the city for the admission and treatment of these patients. We have there seven hundred beds and up to this writing sixteen hundred patients have been admitted. If I had ever doubted the wisdom and propriety of this method of caring for the addicts, all doubts would have disappeared after my last visit there, two or three weeks ago. I happened to arrive at the dinner hour and saw at the tables two hundred husky, red-cheeked, bright-eyed and clear-brained young men who, a month before, were wrecks of humanity, skulking about the streets of New York, seeking narcotics at any cost, even by the commission of crime.

"The patients are now being discharged from day to day and are being returned to the community sound in body, if not regenerated in mind and soul. Society has a very important problem to meet in the reception and placing of these deserving persons. The Department of Health, with the cooperation of various religious and social organizations, is attempting to aid in this process of regeneration.

"I am laboring under no delusions as to the ultimate fate of many of our discharged patients. There can be no doubt that a large number of them will return to the drug. The first time sickness comes, or social disaster, there will be recourse to the narcotic. Until this community and every other is freed from the possibility of obtaining the drug clandestinely, we will have addicts to deal with. It is imperative that there shall be worked out some system of international control of crude opium. It is my opinion that in every country there must come ultimately centralization of narcotic distribution in some governmental agency. So long as it is possible for American manufacturers to prepare the derivatives of opium, ship them to near-by foreign countries and have them smuggled back across our borders, the drug evil will persist. So long as the bootlegger is permitted to operate, so long will there be addiction. Certainly it is incumbent upon the Federal Government, upon the officials of other governments, upon the League of Nations, upon every official body that can be considered in this connection, to move forward toward the realization of some plan for the control of the narcotic evil. There must be intense activity and alertness, otherwise all the efforts of health departments will fail. It is possible to cure a patient of malaria, but if he return to a district abounding in infected mosquitoes, he will have another attack of malaria. The physician and the Department of Health can heal these poor victims and restore them to physical health, but without moral regeneration or such strict governmental control as to prohibit the possibility of illicit possession of narcotics, the problem will not be solved."

In an article by Dr. S. Dana Hubbard, already quoted in part in a previous chapter, general conclusions are given as to the work of the clinic as follows: [2]

"The work of reclaiming the narcotic drug addict in this vicinity at least—judging from those we have seen and helped—is more than worth while.

"The clinic is not the solution—but it aids in bringing the secretive addict out of his lair. He becomes friendly disposed and, deprived of his supply, he is willing to be cured.

"Our experience, as indicated in the statistical data quoted, is that nearly 70 per cent of the addicts are under 30 years of age, and have been less than ten years on their drug, and that comparatively few have any physical reason for indulging in the practice.

"The physical condition of many of these youths, male and female, indicates that most of them can be saved and reformed into useful citizens. They are down, but are very far from being out.

"No doubt, with suitable organization and funds to institutionalize and adequately and properly care for them, not only to effect withdrawal of drugs, but to rehabilitate by several months after-care in the open country, together with efforts to get the individuals away from bad and demoralizing associates, into new and more useful environments, many will revert to useful and normal lives.

"Many of these addicts have never had a square deal, and only need a fair chance to change their ways. Already many of them have been returned to useful lives, and many more can be revamped with proper and necessary help.

"With success in many instances, in spite of the disadvantages under which the clinic has operated and under which this study has been made, we report our experiences; that others may be induced to enter into this work, appreciating its difficulties and complexities, but knowing that success is possible, in many cases.

"We are more than pleased with our efforts, and the results of these labors, and appreciate the cordial support and advice given so freely by all those who co-operated. It is impossible to name any of these persons, but we desire to hereby register our public appreciation of their aid and assistance.

---

[2] Hubbard, S. D.—The New York City Narcotic Clinic and Differing Points of View on Narcotic Addiction, Monthly Bulletin Department of Health, City of New York, pages 33-47. February, 1920.

"With reduction of addiction, generally, the incidence of the abuse of drug tippling, especially in the industrial world, will make future prevention and control easier.

"Many lectures to hundreds of persons have been given by the staff of the Bureau of Public Health Education and this publicity will no doubt deter many from taking up addiction through curiosity or ignorance."

In connection with the clinic the health department provided treatment for such cases as desired it at Riverside Hospital. Dr. A. R. Braunlich, Visiting Physician at Riverside Hospital, in an article outlining the method of treatment pursued by him, comments as follows: [3]

"It is my personal opinion that we are putting the cart before the horse in attempting to cure cases when they are able to procure the drug after treatment. I believe a very large percentage will relapse sooner or later, regardless of the form of treatment they have had, if it is possible to procure their drug. I am willing to admit, however, that proper treatment, covering a protracted period of time, will result in more cures than slip-shod, stereotyped methods, used by many advertising institutions for pecuniary reasons. The treatment at Riverside Hospital withdraws the drug, builds up physically, and we hope a large number will stay cured."

About one and one-half years after the closing of the New York City Clinic, following the repeal of the state anti-narcotic law, known as the Second Whitney law, another type of municipal activity was undertaken in New York. On July 25, 1921, the Board of Health of the City of New York passed certain amendments to the Sanitary Code to be known as "Article 8-A, Habit Forming Drugs." The various sections follow:

"Section 132 . . Prohibited Acts Constitute a Public Menace

"Any unauthorized possession, sale, distribution, prescribing, administration or dispensation of cocaine or opium or any of their derivatives, or cannabis indica, cannabis sativa, or any of their derivatives, is hereby declared to be dangerous to the public health and a menace to the public welfare.

"Section 133 . . Prohibited Acts

"It shall be unlawful for any person to possess, sell, distribute, administer, dispense or prescribe cocaine or opium or any of their derivatives, or cannabis indica, cannibas sativa, or any of their derivatives; provided however that nothing herein contained shall be deemed to prohibit the possession, selling, distributing, administering, dispensing or prescribing of any of the drugs or their derivatives as in this article hereinafter provided.

---

[3] Braunlich, A. R.—Treatment of Drug Addiction at Riverside Hospital. Monthly Bulletin, Department of Health, City of New York, pp. 47-49. February, 1920.

"Section 134 . . Authorized Acts of Trades and Professions

"A manufacturer, wholesaler, apothecary, physician, dentist, veterinarian, private hospital, sanitorium or institution maintained or conducted in whole or in part for the treatment of disability or disease or inebriety or drug addiction, may purchase, receive, possess, sell, distribute, prescribe, administer or dispense cocaine or opium or their derivatives, or cannabis indica, cannabis sativa, or any of their derivatives, provided he shall have complied with all provisions as required by the Act of Congress of December seventeenth, nineteen hundred and fourteen, known as the Harrison Narcotic Law, as the same exists and may be amended.

"Section 135 . . Hypodermic Syringe

"No person except a dealer in surgical instruments, apothecary, physician, dentist, veterinarian or nurse, attendant or interne of a hospital, sanatorium or institution in which persons are treated for disability or disease shall at any time have or possess a hypodermic syringe or needle or any instrument or implement adapted for the use of cocaine or narcotic drugs by subcutaneous injections and which is possessed for that purpose unless such possession be authorized by the certificate of a physician issued within the period of one year, prior thereto.

"Section 135—A . . Exemptions

"The provisions of this article restricting the possession of cocaine, opium or their derivatives or cannibas indica, or cannibas sativa, shall not apply to common carriers or warehousemen or their employees engaged in lawful transportation or storage of such drugs, nor to public officers or employees while engaged in the performance of their official duties, nor to temporary incidental possession on the part of employees or agents of persons lawfully entitled to possession.

"Section 135—B . . Commitment of Addicts: Procedure: Treatment: Discharge

"The habitual use of cocaine, opium or their derivatives, except as administered, prescribed or dispensed by a physician is hereby declared to be dangerous to the public health and safety and in violation of this article. Upon the voluntary application of an addict, any Court or Magistrate, may, if satisfied of the truth thereof and that the person is suffering from such drug addiction, commit such person to a county or city hospital or institution maintained by the City of New York, or any correctional or charitable institution maintaining a hospital in which drug addiction is treated, maintained by the City, or any private hospital, sanatorium or institution authorized for the treatment of disease or inebriety. A court or a Magistrate may likewise on voluntary application commit for treatment to any reformatory or correctional institution, maintaining a hospital or place where drug addiction may be treated, to which institution commitment could be made from the City of New York on conviction of a misdemeanor. Any court having jurisdiction of a defendant who is a prisoner in a criminal action or proceeding, if it appears that such defendant is an habitual user of any such drugs and is suffering as a result of such addiction, may if it commit an addict making voluntary application require the return to the Court of any such addict when such addict is cured or at a time stated in the order of commitment. Whenever the medical officer or superintendent or the head of such an institution shall certify to the committing Magistrate or Court that any person so committed has been sufficiently treated or give any other reason which is deemed by the Magistrate or Court to be adequate and sufficient, he may in accordance with the terms of commitment discharge the person so committed, or return such person to await further action of the Court, as above provided.

"Section 135—C . . Fraud, Deceit, Et Cetera

"Any fraud, deceit, misrepresentation, subterfuge, concealment of a material fact or the use of a false name or the giving of a false address in obtaining treatment in the course of which cocaine or opium or their derivatives shall be prescribed or dispensed or in obtaining any supply of such drugs shall constitute a violation of the provisions of this article and shall not be deemed a privileged communication. The wilful making of any false statement in any required prescription blank, order or record shall constitute a violation of this article.

"Section 135—D . . Penalties

"A violation of any of the provisions of this article shall constitute a misdemeanor. The Department of Health, shall by virtue of the authority conferred by the provisions of the Inferior Criminal Court Act of the City of New York as amended by Section 44, Chapter 531, of the Laws of 1915, except in a case where commitment is made in the Magistrate's Court for treatment, request upon proceeding being had before a Magistrate that violations of this article be triable in the Court of Special Sessions, held by three justices."

This placed the control of the problem as a whole under the courts and the police department of the city administration.

In February, 1922, Judge Cornelius F. Collins of New York City reviews and comments on the New York situation as follows: [4]

"Since our last conference, Chapter 639 of the Laws of 1918, known generally as the Whitney Law, relating to narcotic drug control, has been repealed, by an act approved by the Governor, on May 13, 1921. At the present time, this State is without any law on the subject of cocaine or narcotic drug control.

"The Federal law known as the Harrison Narcotic Law is inadequate to cope with the the drug evil, from a standpoint of legal control in this State, for many reasons, and particularly because of a decision in the case of U. S. v. Jin Fuey Moy, 241 U. S., page 394, holding that the provisions of the Harrison Act refer only to persons required to register under that act, which generally speaking, includes only those who might be grouped within the term 'the trade,' including manufacturers, wholesalers, retailers, physicians, veterinarians and dentists, and thus precluding the Federal authorities in this State, even if their force were sufficient, from properly coping with the evil, particularly with the underworld traffic by peddlers and distributors, and the possession of the drug by unauthorized persons.

---

[4] Report of the Committee on the Drug Evil. Proceedings of the Thirteenth Annual Conference of the New York State Association of Magistrates. Feb. 6 and 7, 1922.

"Your Committee is constrained to report that the drug evil in this State unrestrained by statute, has grown to very serious proportions in its underworld aspect, the extent of which can only be estimated. Illicit peddling, distribution and possession prevail to such an extent as to make the problem, at this time, from a social standpoint, as serious as it has ever been. Some idea may be had of the extent of the prevalence of the evil in the underworld, by referring to the condition existing in the city of New York. Immediately following the repeal of the State law, May 13, 1921, arrests for violation of the drug law by State officers ceased. A sanitary code provision was adopted, which became effective July 25, 1921. Immediately a large number of arrests were made for peddling or unlawful possession. In one month, over 450 cases were arraigned in Special Sessions. This is approximately a 300 per cent greater number than ever brought into the court for violation of the drug law, in a similar period. Some explanation can be made, of course, from the fact that during the period when no law was in operation justifying arrests, the police were alert in obtaining information that made apprehension available immediately on the enactment of the sanitary code.

"In a period between July 25 and December 31, 1921, there were 1,029 cases arraigned in Special Sessions. This is a much greater number than ever before in a similar period, and is over 15 per cent of the entire business of the court. It is extremely likely that similar results proportionately would be shown throughout the State, but where there is no sanitary code provision, there is no means of obtaining statistics. It should be borne in mind, in estimating the extent of the underworld problem, that the actual number of cases arraigned for violation of the drug law refers only to that number of offenders arraigned for the violation of the drug law, and does not include addicts arraigned for the commission of other crimes. That number added to those arraigned under the drug law would swell to much greater proportion the number of drug addicts arraigned in court.

"In the judgment of your Committee, the drug situation has been further hampered by the attitude of the Federal authorities in the enforcement of the Harrison Law, especially in connection with interpretations and rulings made by the Federal authorities. The Harrison Law provides in part, the law shall not apply

> "'(a) To the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist or veterinary surgeon registered under this Act in the course of his professional practice only.
>
> "'(b) To the sale, dispensing or distribution of any of the aforesaid drugs by a dealer to a consumer under and in pursuance of a written prescription issued by a physician, dentist or veterinary surgeon registered under this Act; provided, however, that such prescription shall be dated as of the day

> on which signed and shall be signed by the physician, dentist or veterinary surgeon who shall have issued the same.'

"On October 19, 1921, the Federal authorities issued over the signature of the Federal Prohibition Commissioner and the Internal Revenue Collector, rulings or interpretations, which say in part as follows:

> " 'This Bureau cannot under any circumstances sanction the treatment of mere addiction where the drugs are placed in the addict's possession, nor can it sanction the use of narcotics to cover a period in excess of thirty days, when personally administered by the physician to a patient neither in a proper institution nor unconfined. If a physician, pursuant to the so-called reductive ambulatory treatment, places narcotic drugs in the possession of the addict who is not confined, such action will be regarded as showing lack of good faith in the treatment of the addiction and that the drugs were furnished to satisfy the cravings of the addict.'

"The attitude of the Federal enforcement officers had been along similar lines, especially in the vicinity of this State, for a long time prior to the issuance of this ruling. The effect of the whole has been to absolutely discourage doctors in the treatment of drug addiction, by the prescribing of the necessary drug for its alleviation. This step was taken by the authorities in an effort to stop what is known as the ambulatory treatment of a patient and to bring about hospitalization in all cases. This phase of the subject will be referred to later in this report.

"The Federal courts have interpreted the Harrison Law with respect to the treatment by physicians of drug addicts, to limit the doctor in his treatment of the addict, to the exercise of good faith only; U. S. v. Doremus, 249 U. S. 86; Webb v. U. S., 249 U. S. 96, and other cases.

"The Harrison Law provides that 'The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury shall make all needful rules and regulations for carrying the provisions of this act into effect.' It would seem, as a legal proposition that this authority did not confer the right to make rules which would, in effect, supersede the law; and one cannot conceive of a situation that would enable a Federal prohibition commissioner or an internal revenue collector to substitute their rulings for an act of Congress, or to supersede the powers of Congress and legislative enactment, which must necessarily receive the approval of the President, and which would even then be open to serious question, if forbidding treatment under certain conditions, as to constitutionality in infringing on the power reserved to states. Yet, it may be said, that the effect of the rulings has gone almost to this extent. The Federal decisions are numerous to the effect that an executive department cannot enlarge a statute, so as to make conduct criminal that is not made so by statute, nor to go any further with respect to a provision similar to the one in the Harrison Act than 'to regulate the mode of proceeding to carry into effect what Congress has enacted.'

"The general situation is such as to demand immediate action upon the part of this State, to remedy existing conditions, if the drug evil is to be controlled, and the baneful extension of its consequences arrested. Statement has been made and perhaps with some degree of justification, that the prevalence of crimes and violence throughout the country is due in a measure to the drug evil. It is undoubtedly true that in a very large number of arrests of those accused of felonious assault, highway robbery and burglary, by the dramatic methods recently resorted to, it has been disclosed that the perpetrators were drug addicts.

"The necessity for rational legislation on the subject is therefore, made the more apparent."

Commenting on the amendment to the Sanitary Code of New York City and on the situation as it subsequently developed, Judge Collins continues:

"Under the provisions of the New York City Sanitary Code, it was intended to allow the doctors to practice in accordance with the Harrison law, on the assumption that this permitted a physician to proceed in the course of his profession in good faith, to administer drug if necessary. Immediately following its enactment, however, the doctors obtained the impression that the Federal authorities would regard as a violation of law the treatment of a patient with drug while the patient was at large, unless such patient was at the time suffering from some disease other than drug addiction, with the result that a large number of addicts were forced to resort to the underworld for the purpose of obtaining the drug. This, of course, tended to give added impetus to the traffic in the underworld which immediately after the repeal of the State law had grown to a far greater extent than any that had ever heretofore prevailed.

"On the publication of the rulings of the Federal Prohibition Commissioner and Collector of Internal Revenue above referred to, as chairman of your committee I caused the following notice to be sent to the various members of the committee:

> " 'November 21, 1921.
>
> " 'The Commissioner of Internal Revenue has issued under date of October 19th, some new rulings on the subject of drug addiction, signed R. A. Haynes, Prohibition Commissioner, approved by D. H. Blair, Commissioner of Internal Revenue. I am forwarding you copy of the rulings which are issued in the weekly bulletin of the Department of Health of this city, dated November 19, 1921.
>
> " 'The first intimation I received of the fact that such rulings were adopted was on last Thursday, at the convention of the American Public Health Association. If these rulings prevail, a very serious situation is threatened.
>
> " 'It seems to me that, the Commissioners have exceeded any authority conferred on them by law, have superseded the rights of the State and have even gone beyond the expressed provisions of the Harrison act.
>
> " 'Under the rulings, a physician would be prevented from prescribing drugs for the treatment of drug addiction, notwithstanding the provision of the Harrison law, to the effect that that act would not apply to a "physician . . . registered under this act, in the course of his professional practice only."
>
> " 'The number of addicts is by far too great, even if they were all willing

to submit, to be accommodated by hospitals available for such purposes. The result bound to follow would be that the addict would be forced, in most instances, to resort to the underworld to obtain the drug, which means increased peddling, increased illicit distribution, increased smuggling and incidental crimes in the wake of the underworld addict.

"'I, therefore, feel it absolutely necessary to call a special meeting of the Committee on the Drug Evil of the State Association of Magistrates, and believe that three p.m., Tuesday, November 29th, at my chambers in the Children's Court, 137 East 22nd Street, New York City, the most convenient time and place.

"'Won't you please make every effort to attend, and if you can not, please communicate with me on the subject at your earliest convenience.

"'Faithfully yours,
"'(Signed) Cornelius F. Collins,
"'Chairman, Committee on Drug Evil,
State Association of Magistrates.

"'P.S.—It has occurred to me that I ought to have said in the foregoing that the basis of the Commissioner's conclusion is largely error:

"'1. As to the evil being a medical question only (it needs no argument to prove that it is sociological as well).

"'2. As to the report of a committee in the "A. M. A." expressing the consensus of medical opinion—which is incorrect.

"'C. F. C.'

"In response thereto, there was a general agreement of approval and an indication that action should be taken at this conference.

"I have had statistics prepared which are attached to this report, showing the number of cases coming into the Court of Special Sessions, from the time of the enactment of the first drug law, and those figures bear out the contention that was made, that the extreme interference with the doctor in the treatment of the drug addict is a serious mistake. The figures show too, that the average age of the addict in each year between 1916 and 1921 inclusive, was as follows:

"1916—The average age of all addicts coming into Special Sessions was between 23 and 24 years.
1917—26 and 27 years.
1918—25 and 26 years.
1919—26 and 27 years.
1920—25 and 26 years.
1921—26 years.

"The number of addicts coming into the court increased and decreased according to varying legislation and shows the effect of regulations and the like. The lowest number came into the court in 1918 (540), when the State law operated without any undue restrictions."

Judge Collins gives the following statistics of cases passing through his court:

"Drug Cases in the Court of Special Sessions

(Five Counties)
Cases Received

							1921		
"1914	1915	1916	1917	1918	1919	1920	Jan. to May 13	July 25 to Dec. 31	Total
1,415	1,503	1,686	1,283	540	846	1,266	599	1,029	1,628

"Note as to Above

"The 'Boylan law' became effective April 14, 1914. The year prior to the enactment of the 'Boylan law' there were only 106 cases received in this court.

"The first 'Whitney law' became effective May 9, 1917. The second 'Whitney law' became a law May 13, 1918 and went into active operation, as to crime, February 1, 1919.

"The 'Miller act' became effective May 13, 1921, although that part of the act dispensing with the services of the Commissioners and for the final transfer of records to the State Health Department was effective June 30, 1921.

"The City of New York Sanitary Code amendment became effective July 25, 1921. . . ."

Reporting again to the New York State Association of Magistrates,[5] in 1923, Judge Collins says:

"The bill recommended by your body for enactment failed to pass the Legislature, and there is at present in the State of New York no law regulating the subject of the drug evil except wherever local provision is made by sanitary codes or local health laws. I am unaware of any existing except in the City of New York.

"The arguments presented by your committee and adopted by the Association to the effect that there is no general increase of the drug evil but that there is an increase of the aspect of the evil, as indicated in the so-called 'underworld,' is more manifest this year than before, and the experience in the Court of Special Sessions of the City of New York, for instance, bears out the arguments heretofore made by your Association as to the necessity for State law regulation along the lines referred to in the formal report.

"I caused the report to be printed and forward to your body some copies, sufficient number of which can be obtained upon request for any purpose the conference may desire.

"Permit me to recommend that the printed report be read to the conference as the report of the Committee on the Drug Evil, with this addenda:

"In the Court of Special Sessions, which is the pulse of the 'underworld' cases, to the extent of showing the number arrested for illegal possession or for traf-

---

[5] Report of the Committee on the Drug Evil. Proceedings of the Fourteenth Annual Conference of the New York State Association of Magistrates. Feb. 5 and 6, 1923.

"Comparative Percentage Table as to
Males (83.2 per cent) and Females (16.8 per cent)

Year	Average age		21 years and under	Under 21 years
		%	%	%
1916	23 years	48.12	28.27	18.91
	24 years	54.29		
1917	26 years	54.6	20.1	12.3
	27 years	57		
1918	25 years	49.7	16.2	10.5
	26 years	54.15		
1919	26 years	51.7	12.6	6.5
	27 years	56.1		
1920	25 years	46.5	17.8	8.2
	26 years	53.5		
1921	26 years	44.8	12.32	6.16

"Cases Received

1914	1915	1916	1917	1918	1919	1920	1921		
							Jan. 1 to May 13	July 25 to Dec. 31	Total
1,415	1,503	1,686	1,283	540	846	1,266	599	1,029	1,628

		Per cent
1914–1915*	Increase	6.21
1915–1916	Increase	12.17
1915–1917	Decrease	14.64
1916–1917	Decrease	23.9
1915–1918	Decrease	64.08
1917–1918	Decrease	57.09
1915–1919	Decrease	43.74
1918–1919	Increase	56.66
1915–1920	Decrease	13.77
1919–1920	Increase	49.65
1915–1921†	Increase	8.31
1920–1921	Increase	28.59

---

* Figures for year 1914 are as of April 14, 1914, the date the 'Boylan law' became effective.

† Figures for year 1921 are from January 1st to May 13th, and July 25th to December 31st. No law in interim, owing to repeal of State law.

Sanitary Code provisions became effective July 25, 1921."

ficking in drugs, in that it shows the numbers arraigned in that court, showed that during the year 1922 there was a total of 2,211 cases.

"In the appendix to the report of one year ago, the number of cases of each year, from 1914 to 1922 inclusive, are shown.

"The total number for 1922 indicate a larger number of cases than ever before coming into the Court of Special Sessions, and is fully 20 per cent of all kinds of cases coming into the court. That in itself gives an indication of the horror of the situation.

"The increase in percentage of cases over 1921, the total of which was 1,628 cases, is 35.8 per cent.

"The increase over the year 1918, when the Whitney Law was in operation, when doctors were permitted to treat addicts under reasonable regulation, is 309.4 per cent. In other words, in 1918 there were only 540 cases of the kind coming into the Court, and in 1922 there were, as above stated, 2,211 cases.

"Attention is called to the fact that the average age has increased. In 1921 the average age of all addicts was placed at 26 years. The number of addicts coming into the Court, 21 years and under, was 12.32 per cent, and of addicts, under 21 years of age, 6.16 per cent.

"In 1922 the average age has been increased to 29 years while the percentage of those 21 years and under has been reduced to 8.2 per cent, and the number under 21 years of age reduced to 4.7 per cent.

"These figures compellingly show the logic of the arguments advanced by your association, namely, that the failure to have State regulation permitting treatment by medical men in their general practice, as well as treatment in hospitals, has largely increased the 'underworld' traffic and distribution of the drug, and that is shown by the very large increase in the number of cases coming into the Court.

"It further shows, by the change in the average age of all addicts, that the Court is dealing with old addicts instead of newly formed addicts; that the increased average age, 29 years, and the decrease of those 21 years and under, and those under 21 years, to percentages almost negligible, significantly prove that the old addicts are driven to the 'underworld' market for their drug."

After reviewing the attempts to secure state legislative action and their failure he continues:

"The very great conflict referred to in the printed report as to the solution of the drug evil, from the standpoint of legislation, is in such a state of chaos that it may be that legislation recommended by either school of thought may not be successful in passing the Legislature, but the seriousness of the situation is so great that something must be done.

"In view of that fact, your committee respectfully recommends, in the alternative of a bill similar to that which is above referred to, not being adopted, that your Association go on record as urging the appointment of a new joint committee of the Senate and Assembly to investigate the subject of the drug evil and to report back to the Legislature of 1924, this with the aim of reconciling all conflicting opinions on the subject and of ascertaining the true state of facts and intelligently reporting to the next Legislature so that action may be taken looking to a practical solution of this serious social problem."

Carleton Simon—1924.[6]

Simon reports on present conditions in the City of New York as follows:

"In the city of New York, narcotism has decidedly decreased during the last three years. This is evidenced by the fact that a beginner is now rarely found among the addicts recently apprehended. Constant vigilance is necessary, for relaxation on the part of the police results in the immediate influx into this city of thousands of addicts from all over the country, and addiction would claim many new victims.

"Only about 10 per cent of the addicts arrested by the police are women. The percentage of female to male addicts is, however, much greater. They are not so liable to arrest, as comparatively few of them personally make their purchases on the street. It is delivered to them or bought usually through some male addict.

"Evidence of the control of the situation is shown by the statistics of the ages of addicts. In 1921, when we were several months without a suitable narcotic law, in New York City, a large number of persons became addicts, mostly in the ages of 18, 19 and 20, and the peak age then was around 25 years. That is to say, there were more addicts giving the age of 25 years than any other age. In 1922, this peak age was 27 years, while this year the ages 27 and 28 are almost equal."

Shreveport, Louisiana.

The following is a brief history of the life of the narcotic clinic and hospital treatment at Shreveport, La., instituted as control measures under authority of the State Board of Health of Louisiana. We have already quoted from the minutes of the board and from opinions of the state attorney general and assistant attorney general upon whose authority the board's action was taken in establishing the New Orleans dispensary. While the Shreveport clinic was begun as a state activity, the greater part of its existence occurred under the authority of the municipality. It is included, therefore, in this chapter.

From the unpublished reports with which W. P. Butler, medical director, has supplied us, we have obtained the following outline of the clinic as operated under his supervision. Inasmuch as this clinic has given rise to much discussion we are including also such expressions of opinion from organizations and copies of correspondence as dealt with it during the different periods of its existence.

---

[6] Simon, Carleton—Survey of the Narcotic Problem. J. A. M. A. March 1, 1924. Vol. 82, No. 9, pp. 675-679.

HISTORICAL SKETCH

Inception, Development, Municipal Activity, Reasons for Closing

During 1916 four physicians of Shreveport were indicted for violating the Harrison Act. They were not convicted but the incident had a psychological effect upon the medical profession as physicians hesitated, as Dr. Butler says in his report, to care for cases of addiction lest they unintentionally violate the federal law, avoiding the handling of these cases rather than studying the law, the case itself and the problem as a whole.

This state of affairs became apparent to Dr. Butler, the parish physician, as the chronic users of opium applied to him for assistance and very quickly developed a sociologic problem which the community was not equipped to handle. Some of the cases were sent to jail for treatment and either were withdrawn from the drug or supplied by smuggled drug. A number of them died.

Eventually the use of four rooms in the jail was secured for the treatment of these cases but because of the inadequacy of equipment and of the difficulty in stopping the smuggling of the drug, this work was not successful.

In 1919 the state board of health appointed a physician in Shreveport to take charge of the narcotic situation. He wrote all the prescriptions of these cases, which were filled at one authorized drug store. This arrangement lasted but one month, its failure being due to three factors: first, the expense and trouble to the patient who was required to secure daily prescriptions when he could patronize the peddler more easily; second, the impracticability of one physician's attempting to care for so many cases without assistance; third, the druggist's objection to having his store patronized by a class of people looked upon by the public as criminals.

The physician who had been appointed to handle this situation resigned and Dr. Butler was instructed by the state board of health to care for these cases by establishing a dispensary. That the need of some provision was increasing is shown by the following excerpt from a letter to Dr. Butler from the president of the state board of health:

"We are getting daily the names of patients being discharged from the Army and Navy who reside near Shreveport and who should be sent there for treatment, but as yet we are unable to refer them there."

Dr. Butler organized his dispensary and with the assistance of a pharmacist and special assistants supplied the drug to chronic users according to state regulations which will be explained later. Quarters in the Charity Hospital were secured for the treatment of curable cases. During the first two years the number of patients handled at the dispensary was reduced from 494 to 188, some having been cured and others in one way or another eliminated.

On March 15, 1921, the Louisiana State Board of Health after consulting with the federal narcotic officials discontinued the narcotic dispensaries in New Orleans, Alexandria, and Shreveport. Upon the following day Dr. Butler reopened the Shreveport dispensary and moved the institution for treatment from the Charity Hospital to a house near the business centre of the city. He continued to work on his own responsibility as parish physician and through the authority of the city council of Shreveport, expressed in the following ordinance:

"(1) 'That a public health hospital and out-patient service be, and the same is hereby established for the City of Shreveport.

"(2) 'That said institution shall be under the charge and control of the City Council of Shreveport and its management subject to the supervision of said Council, shall be under the direction of Dr. Willis P. Butler, Parish physician until such time as it may be otherwise ordained by this body. The purpose of said institution is declared to be for the treatment of narcotic and venereal cases.

"(3) 'Be it further ordained: That whereas the Police Jury of the Parish of Caddo defrays a portion of the expense of said institution the said Parish physician is empowered to care for and treat the same class of patients for the Parish of Caddo.'"

The last clause of this ordinance shows that the Police Jury had already taken action. In fact previous to and anticipating the state board of health's order to close the dispensary and institution, the Police Jury had passed a resolution to continue Dr. Butler's narcotic work.

This briefly outlines the inception and development of the dispensary and institution for treatment. The need of municipal action begins with the indictment of the four local physicians already mentioned and had its final expression in the passage of the ordinance continuing the method that the council had found to be effective. During the years 1921-23 this arrangement controlled satisfactorily the narcotic problem. One hundred and forty patients were given curative treatment while the number of cases attending the dispensary was decreased to one hundred and one.

Early in 1923 a conference was held in the office of the United States District Attorney between Dr. Butler and the federal narcotic agents. As a result of this conference it was decided to close the dispensary. The agent present at the conference stated that he had been sent "to close the clinic because it was the only one left in the United States." In commenting on this Dr. Butler quoted from a letter written by Dr. L. M. Powers, Health Commissioner of Los Angeles, California, who said when the Los Angeles clinic was closed in 1921:

> "I have not been able to realize the actual purpose of the closing of our clinic for there has been some unseen motive prompting much opposition to clinics which I have not been able to comprehend."

THE DISPENSARY

Method of Operation—Results

The dispensary was located in the director's laboratory in the Shreveport Sanitarium with the following personnel: medical director, chief clerk and bookkeeper, assistant clerk and finger-print expert, pharmacist, dispenser, three inspectors selected with the approval of the police department, the local board of health and the medical director; other assistants for special work were employed when needed.

The dispensary days were Monday, Tuesday, Thursday, and Saturday from 8.30 to 10.00 A. M. and from 4.30 to 6 P. M. Where these hours created a hardship on the patient he was cared for at some more convenient time.

Morphin was dispensed in solution, the container being labelled to show the amount in grains and the price. The doses varied from one grain to as much as twelve grains a day for certain patients, the average being eight grains. In each case the amount of morphin dispensed was the least that the patient could take and still remain in "drug balance." Since the dispensary was not intended for curative treatment but as a means of caring for incurables and those physically unable to undergo treatment, no effort was made to reduce the amount finally decided upon as the patient's proper dose.

The cost of morphin as supplied at the dispensary was an important matter as will be explained later. The wholesale price of the drug varied from two to three cents a grain. The dispensary price was six cents a grain as against the druggist's price of ten to twenty-five cents a grain, exclusive of the prescription fee, and the peddler's price of $1.00 a grain. Under the dispensary management the difference between the cost and the selling price paid the actual operating expenses of both the dispensary and the institution for treatment, the entire undertaking being self-supporting.

Patients admitted to the dispensary were carefully examined and recorded. In the beginning any patient applying was admitted but the number was necessarily limited later to residents of the state and again later to residents of Caddo Parish. They were divided through examination into the curable and incurable cases and placed in one of the two classes. Complete medical histories were taken, together with information relating to age, sex, color, length of time during which the drug had been used, former treatment, and the causative factors, together with an exhaustive physical description. Finger-prints with personal description were sent to the local police department, to the local detective agency and to Leavenworth.

Before being dispensed to, the patient was requested to sign a pledge not to sell, give away, lend, borrow, or otherwise obtain any of the drug. His residence and business addresses were secured and frequently checked by inspectors. All patients able to do so were required to work and to secure proper food and clothing. No loafers were tolerated. These rules governed patients who were not infirm, decrepit, or bed-ridden.

A monthly record sheet contained the names of the patients. Upon receiving their medicine patients signed this register, the clerk entering opposite the signatures the amount dispensed in grains and the price paid. This daily record was kept of those coming to the dispensary in person. For those who were bed-ridden or who held a doctor's certificate as to infirmity a special order form printed on safety paper was employed. These were serial in number, dated and signed, and gave the reasons for the individual's inability to come in person, together with the name of the authorized proxy. Only one order form was issued at a time and a strict record kept of each.

The institution for treatment was located at the Charity Hospital until the work was discontinued by the state board of health in

1921 when it was established in another locality. It was called the Public Health Hospital and in addition to treatment for chronic users of opium it provided treatment for cases of venereal disease either free or at the cost of the medicine. This institution had a resident physician, superintendent, nurses, guard, and attendants.

The rules governing the institutional treatment of the narcotic patients were as follows:

"(1) Institutional treatment is free to any resident of Caddo Parrish.

"(2) An addict who is able physically to undergo treatment must sign voluntarily an application for commitment to the institution. (If he is judged physically able and will not take the treatment he is no longer dispensed to.)

"(3) He also signs a request to be placed in the Parish jail to complete the treatment if for any reason this may be deemed necessary by the Director.

"(4) He is required to make a deposit of twenty-five dollars for his own use at the end of treatment, unless he is known to be in good financial circumstances.

"(5) The medical method of treatment is divided into three parts, (1) Previous preparation; (2) the period of narcotic withdrawal under restraint; (3) after care. By the first term is meant, assurance that the physical condition is strong enough to endure the rigor of the withdrawal. The salient features of the treatment proper, are rapid withdrawal and substitution, proper elimination, abundant food, rest and warm baths. By the third term is meant, a place of convalescence, preferably in the country."

RESULTS

Dr. Butler states that the results from the points of view of the users, physicians and druggists, and society at large from a properly operated dispensary and institution for treatment have a distinct medical and sociologic value.

First: The patient. Such a treatment prevents or alleviates a great deal of physical suffering. The dispensary and treatment institution treated all cases including the parish prisoners. The curables were treated first for whatever physical conditions they were suffering from and then for their drug intoxication, while the incurables were improved physically and their doses properly regulated. Many cases who had been "down and out" were raised to a plane of decent living. With their drug inexpensive and regularly supplied they were enabled to work and provide for their families. In the opinion of the Associated Charities, federal and parish authorities and the city police department, crime was prevented and the narcotic problem from every angle was ameliorated by the medical care of these patients.

Second: Physicians and Pharmacists. The system was helpful to physicians and druggists in that it saved much of their time and prevented annoyance from the insistent demands of individuals for whom they could not regularly care. It prevented duplication of work for one patient and neglect of others. That the medical profession appreciated this work is shown by its unqualified support and approval of the clinic as evidenced by the passage of resolutions to this effect.

Third: Society as a whole. That the work of the clinic was beneficial to society as a whole is apparent. It reduced the number of future users and the system that made the dispensary effective became an auxiliary to the city's police department. Dishonest and unworthy cases were detected, cut off from the dispensary and because of the absence of peddlers in the city were forced to move away. Thus crime was prevented, as there was no profit possible for criminal addicts or peddlers. A considerable burden of indigency was saved the city by the rehabilitation of these patients.

RELATION OF CLINIC TO:

1. Peddling
2. Federal and state-control measures
3. Other methods of control.

1. It prevented peddling and the pauperizing of the user. It prevented illicit sale by (a) providing for the incurable cases, preparing the curables for treatment and treating them, whereas the peddler deliberately increased his sales by creating new users and (b) eliminating the vicious type of user.

2. The chief manifestation of federal control has been the arrest of users in order to stop the illicit traffic. This method of control, according to Dr. Butler, only aggravates the situation as it makes dependents of the user's family, which thus creates a social and economic problem.

Dr. Butler quotes the United States Marshal as having stated that through taking advantage of the facilities afforded at the clinic he was able to secure quick relief without the unnecessary resorting to red tape required under other circumstances. Through the detective system practised by the dispensary many arrests of peddlers were made and evidence sufficient to convict them secured, but Dr. Butler states these cases when brought into court were either repeatedly postponed or dismissed.

3. Another method of control that Dr. Butler claims is a complete

failure is that of the enforced treatment of users. This procedure results in repeated relapses, deaths, or suicides during the withdrawal, or smuggling of the drug into the institutions in which these cases are confined. In this connection Dr. Butler gives the following acknowledgment from the state board of health president:

> "Your statistics in cures are decidedly higher than those of any others we have received."

In conclusion he states that federal and other state control measures employed have failed to give such good results as were derived from the operation of the dispensary and the institution for treatment, namely:

> One responsible organization to control supply.
>
> Proper facilities for observation, examination, and treatment of patients.
>
> Ability to care for incurable cases without expense to the community and at but slight expense to the patients.
>
> A self-supporting system.

Since the closing of the dispensary, Dr. Butler reports the deaths of several former patients, three of these in jails in other cities, while a number of his patients have been sent to the state penitentiary. Of the remainder of the one hundred and one incurable cases, Dr. Butler continued to care for forty for about a year. The others he states were supplied by peddlers at $1 or more a grain inasmuch as their physicians refused to care for them. Individuals who during the life of the dispensary were leading decent lives and supporting their families reached a condition of wretched poverty. In 1924, the number of incurables attended by Dr. Butler was reduced to twenty-four and then to twenty-one. These were continued until March, 1925, when he ceased prescribing for them. Of the forty cases remaining in his care after the closing of the clinic, four have died, two or three found other physicians to care for them temporarily, a few moved away, and the others have been forced to patronize peddlers.

The organized charities, he states, recognize the evil effects of the closing of the clinic and the city police department and the sheriff report that they are having endless trouble with users and peddlers. Petty crimes are increasing and the peddlers are creating new cases.

The following communications supplied by Dr. Butler from professional groups are of interest in connection with the operation of the Shreveport narcotic clinic:

"To the Shreveport Medical Society:

"This committee appointed to investigate and report on the Shreveport Narcotic Clinic begs to report as follows:

"We had an interview with Dr. Butler at his office on September 29th, and wish to express our unqualified approval of the work being done by Dr. Butler and his associates. We were most favorably impressed by the conduct of the Clinic including the details of complete records of all addicts coming under care, classification of addicts, and treatment according to classification, the elimination of non-residents of La., and the careful treatment of curable cases *Under restraint,* the procuring of employment for addicts who are able to work while attending at the dispensary and for cured patients who wish to remain in Shreveport after recovery, are all features of this work that strongly recommend the conduct of this Institution.

"It is significant that Dr. Butler's judicious and tactful conduct of the Clinic has secured for him the unqualified support and cooperation of the Federal, State, Parish and City Authorities, and the State and City Boards of Health.

"In brief we wish to express our unqualified support and approval of the Shreveport Narcotic Clinic and its systematic and effective administration by Dr. Butler.

"Signed: W. H. Billinghaley, M.D.
J. J. Frater M.D.
J. G. Pou M.D.
Committee"

"This report was presented to the Shreveport Medical Society at the regular meeting Oct. 5, 1920, and was unanimously adopted."

"Shreveport, La.
"March 15, 1921.

"At a regular staff meeting of the T. E. Schumpert Memorial Sanitarium held at the Sanitarium Tuesday night, March 15, the following resolution was unanimously adopted:

"Resolved that, in the judgment of the Staff of the T. E. Schumpert Memorial, that, for the best interest of humanity and the community, it is advisable that Dr. Willis P. Butler continue the so-called narcotic dispensary and institution as now conducted in the City of Shreveport.

"The following doctors were present at this Staff Meeting:

J. C. Willis
B. C. Garrett
J. R. Knighton
J. J. Frater
J. M. Bodenheimer
J. G. Pou
F. G. Ellis
S. C. Barrow

T. D. Boaz
R. F. Harrell
M. S. Picard
M. R. Purnell
I. B. Hougon
Thos. Ragan
Dr. Harwell
Dr. Yerger

"Signed: W. S. Kerlin, Sec'y-Treas."

"March 23rd, 1921.

"Dr. Willis P. Butler
Shreveport, La.

"Dear Doctor:—

"The following resolution was adopted by the Staff of North La. Sanatorium, at its regular monthly meeting last night, March 22nd, 1921.

"Resolved that, in the judgment of the Staff of the North La. Sanatorium, that, for the best interests of humanity and the community, it is advisable that Dr. Willis P. Butler continue the so-called Narcotic Dispensary and institution as now conducted in the city of Shreveport, La.

"The following doctors were present:

Dr. D. H. Alverson
Dr. S. C. Barrow
Dr. J. M. Gorton
Dr. A. G. Heath
Dr. R. F. Harrel
Dr. L. H. Pirkle
Dr. M. R. Purnell
Dr. R. A. Pain
Dr. G. C. Rigby
Dr. J. E. Slicer
Dr. V. Simmons
Dr. J. F. Tanner
Dr. Wm. P. Yerger
Dr. Thos. F. Ragan
Dr. C. B. Hicks
Dr. Hearn

"Yours truly,
"(Signed) J. M. Gorton, M.D."

Los Angeles, California

Another municipal effort at control was made in Los Angeles under the direction of the health department. Two reports of the medical director of the clinic, Dr. W. H. Bucher, set forth the local situation, the nature of the undertaking, and the results obtained during the brief life of the clinic.

The objects are stated by Dr. Bucher as follows—

"(a) To care for the addicts in a humane manner, and endeavor to withdraw the morphia consistent with the health of the patient, and by personal contact give assurances that we are trying to help in overcoming the disease from which they are suffering.

"(b) By the establishment of the clinic to break up the gang of peddlers and traffickers who prey upon these unfortunates.

"(c) In caring for this class to protect society in general.

"(d) Select certain patients for a 'cure.'"

It was the intention of the clinic to supply to each user an amount sufficient for only a short period of time, but it was recognized that, in the case of patients coming from a distance as well as of those suffering from intercurrent maladies, considerable latitude had to be exercised.

Stock solutions of morphin were employed and by the use of these solutions attempts were made to reduce the amount of the drug without the patients' knowledge. This system not always was found advisable as it was sometimes necessary to increase the dose, in which cases Dr. Bucher believed that the psychical effect was bad, that is, discouraging to patients who were making an earnest effort to become cured. He states that there were unmistakable signs in the cases of those who were not on a "balance" dose, especially among the laborers and certain other workers. In these cases too small a dose caused such weakness as to jeopardize their positions.

Where operations were needed, Dr. Bucher thought the drug should be continued until the operation was completed and health restored, as such cases would then be in a better condition to stand treatment. It was found that in many cases individuals purchased additional drug from peddlers after the reduction in the clinic dose had reached a certain point. Dr. Bucher concluded from this that too great a reduction defeated one of the clinic's purposes—that of eliminating the peddlers—and that the fact must be accepted that unless the required balance was maintained certain cases would patronize illegal sources of supply. The necessity of an institution for treatment was early appreciated—preferably some place where an out-of-doors life could be followed by the inmates. It was pointed out that certain types of users were centers for disseminating the use of the drug and that such cases should be isolated for a period of treatment. It was also advocated that a sufficient time be allowed for convalesence to build up the patients' nervous tone to a point where relapses would not occur.

The number of cases treated at the Los Angeles clinic has already been discussed in the chapter dealing with extent. The only drug dispensed at the clinic was morphin though many of the patients had been users of cocain. In addition others had used heroin or smoked opium. Those using heroin and the opium smokers were shifted readily to morphin. It was found that new patients invariably gave the history of using large doses, 15 to 30 gr. a day, a few only using 2 or 3 grains. The fact that such large amounts were not necessary was explained and only 6 or 8 grains were dispensed. If withdrawal symptoms developed within the next few days, the statements of the patients as to the large doses were determined to be true, but if no such symptoms were apparent, a further reduction was made. Thus an effort was made to maintain these cases on a "balance" dose until they were stabilized, after which, under favorable conditions, a further reduction was made. As a general rule, patients who had been using large doses became adapted to the smaller doses after a few days and were more able to work and felt better than on the larger doses. Individuals varied, however, in their ability to stand reduction. One object of the clinic was to keep the patients, where possible, at work so that their doses were cut only to the lowest possible figure which permitted of their continuing their occupations and watching for opportunities when, with their physical condition improved, a further reduction could be made. All patients were examined physically and whatever intercurrent ailments existed as far as possible were corrected. The regulation of the Harrison Narcotic Act requiring a continuous reduction in these cases was observed as far as possible at the clinic but as Dr. Bucher states—

> "It would seem fair to accept the fact that a worker and a producer is of more value to the community than a non-worker and a dependent, or perchance a criminal even though he is suffering from an involuntary chronic disease or a self-inflicted one."

He states that in the case of tuberculosis, venereal and other chronic diseases, patients were encouraged with the help of clinic treatment and supervision to pursue their ordinary occupation but that only too often drug cases were allowed to go without assistance and thus made dependents or criminals. He points out that with his drug the user can function, that without it he is sick, unable to work and has but one object in life, namely, to secure the drug that will put him on his feet. At the price charged at the clinic, ten cents a grain, users could afford to buy what they needed, while in many instances the total earnings of these cases were not sufficient to supply them with the drug from illicit sources at the peddler's price of $1.00-$2.50 per grain. Dr. Bucher states that the degenerate class of users should be distinguished from the others and that with many of the latter type it is possible to accomplish much in the way of salvage. It is unfair, he states, to put all of these individuals in one class simply because they are "addicts." He continues:

> "Their mental make-up varies as much as any other class of diseased humanity, and we find those with courage as well as the coward, and the ones who tell the truth and many liars, some with outstanding virtues that even morphia has not been able to crumble. It should be the endeavor of the community to sift these worthy ones out and reclaim them, and generally speaking of the whole mass, it would be infinitely better to have them at work using a moderate amount

> of morphine than turned loose on the streets desperate . . . organization, even for morphia addicts, seems better than disorganization. . . ."

Ninety-one applications for hospital treatment were made of which eighteen were cared for by an appropriation from the city and eighteen others were treated at the county hospital.

The attitude of the clinic was that these patients were sick and in need of medical help. Dr. Bucher states:

> "From the many letters received at the time of the clinic's last days we glean one salient fact that with the clinic operating these unfortunates were able to work, and have the ideal of normal men to look up to. Some who came to the clinic ragged and filthy, left it with decent clothes, a bank account, and a sense of having been a part of the machinery of production. Just what will become of those who prospered with the clinic is open to rather dismal conjecture."

* * * * *

> "Every day since the clinic has closed there have been patients, their relatives, and friends, come to tell us of the tragedies that followed in the wakes of these addicts' failure to get their morphia. Families have been broken up, men and women have lost their jobs, others have gone where the drug is accessible—all of this cemented together with suffering that takes courage to see.
>
> "The problem is still with us and unsolved. It is reasonable to suppose that it will recur and recur again offering itself for solution. Perhaps later popular opinion will be influenced by the fact that this is a disease, and then in some systematic manner permit its study and it is hoped some lasting cure will be found."

Writing of the clinic under date of April 18, 1921, Dr. L. M. Powers, Health Commissioner of Los Angeles, states in part:

> "Our clinic was closed in August, 1920, and we have not been able to do any successful work since then. A few patients were treated in the various private hospitals, by some of the committee who were working with us, with indifferent success."

* * * * *

> "We regret very much that we were unable to carry to a successful issue our clinics and final treatment of addicts in Los Angeles. We saw ahead of us great results, much greater than we had anticipated when we first commenced work, but you know all of our health work depends upon somebody else's direction and financing consequently we, in this matter as in others, have had to bide the time when the people could be better educated.
>
> "I have not been able to realize the actual purpose of the closing of our clinic for there has been some unseen motive prompting much opposition to clinics which I have not been able to comprehend."

Mr. John P. Carter, formerly Collector of Customs of the Los Angeles District, writing to Doctor Powers under date of March 31, 1921, states in part:

> "I never was connected with any work that appeared to me to afford such a field for service as during my connection with you, Dr. Barrow, and the other splendid physicians who gave of their time and of their intelligence so liberally in an effort to deal with the narcotic situation. I believe there is a place in there for service to human kind that will be more richly rewarded in the way of human salvage than in any other field of endeavor. It is a crusade as admirable and as deserving of success as any other crusade in the whole tide of time.
>
> "I can't understand the opposition to it from any other premises than that we are so thoroughly commercialized that great commercial interests are more powerful than human sympathy. Perhaps only a pessimist would take this doleful view of things and I shall gladly dub myself a pessimist if I can have the gratification of knowing that I am wrong.
>
> "Our clinic here was closed on order of the Prohibition Director of the State of California, at that time Mr. John L. Considine. He was supposedly acting under instructions from his superior officer, the Commissioner of Prohibition in Washington, under whose direction the administration of the Harrison Narcotic Law falls. I forget the name of the Prohibition Inspector who came down and ordered our clinic closed, but he read his instructions and they were mandatory and did not admit of any action to correct the view that they had taken of affairs. How the prohibition officials arrived at their determination to close the Los Angeles Clinic, or the reasons that impelled them so to do are unknown to me, but the case was closed when that narcotic inspector came here and it was at direct written order that the clinic was closed."

In addition to the foregoing municipal efforts at control of the problem of chronic opium intoxication, clinics were opened with or without hospital provisions in about forty other cities, including

San Diego, California; Bridgeport, Hartford, Meriden, New Haven, Norwalk and Waterbury, Connecticut; Atlanta, Augusta and Macon, Georgia; Paducah, Kentucky; Albany, Binghamton, Buffalo, Corning, Elmira, Hornell, Middletown, Oneonta, Port Jervis, Rochester, Saratoga Springs, Syracuse, and Utica, New York; Durham, North Carolina; Youngstown, Ohio; Providence, Rhode Island; Knoxville, Memphis, Tennessee; Houston, Texas; Clarksburg, West Virginia.

These were operated for varying lengths of time, but all eventually were closed by order of the Commissioner of Internal Revenue.

CHAPTER XIV

CONTROL *(continued)*—MISCELLANEOUS SUGGESTIONS

The following comprises general suggestions for the solution of the problem of chronic opium intoxication taken from reports of committees, original papers, and medical editorials.

American Medicine—1915.[1]

"The management of drug addiction is not a police or a penological problem. On the contrary it is a medical problem purely and exclusively. The drug addict is sick, with a pathology as definite as that of any other toxic disorder. This is the great fundamental fact concerning drug addiction and when the medical profession realizes it, the solution of the drug addiction problem will be over half solved.

"Unfortunately, the afflictions of the drug addict have made him a shining mark for unscrupulous individuals and the dishonest and underhanded methods to which he has been subjected have been encountered not infrequently where least suspected. Some day the whole sordid story of 'The Exploitation of the Drug Addict' will be written, and a good many things will then be known that are not known now. It will make interesting reading, and be a revelation in the ways and means of unscrupulous drug habit specialists, and 'the gentle art of fleecing patients' or 'the painless removal of the last dollar.'"

S. H. Rubin—1916.[2]

"The aged user, the paralytic, and others too far gone for treatment must have their daily supply. Who shall prescribe for them? The question, to be properly answered, must involve the proposition limiting the manufacture and sale of narcotic-drugs to government agencies, and the right to dispense narcotic-drugs to local boards of health. By so centralizing the source of supply in local boards of health and by compelling the druggist, the physician, the dentist, and the consumer to obtain their supply from this source, the irredeemable user could be taken care of and the unscrupulous physician and druggist would be eliminated, permitting the crusade against the evil to progress without hindrance from that source. At the same time, the redeemable addict could be induced to enter an institution for treatment even for a protracted period, if his source is completely cut off.

---

[1] American Medicine, New Series, Vol. X. No. 11, pages 799-801, Nov. 1915.

[2] Rubin, S. H.—Drug addiction and modern methods for control. Boston M. & S. J. 175-792. Nov. 30, 1916.

"These suggestions apply only to the social users, of which there are approximately seventy per cent. The criminal and delinquent type, of which there are approximately twenty per cent, are subjects for the penologist and criminologist. This class of users is the most hopeless and most dangerous element to deal with. They are intractable, cunning, designing, and wholly devoid of moral responsibility. It is their ambition to enlist new victims in the army of drug users, making it their business to keep them constantly supplied. In this class may be found the drug peddler, the white-slaver, the pick-pocket, the panhandler, and the all-round crook. Therefore, the successful eradication of the evil and the uprooting of the traffic would necessarily entail a disposition of this class of narcotic-drug users. With the elimination of this class the task of caring for the social user and for those who have contracted the habit through illness would be less difficult. The latter class constitute approximately ten per cent of users, and indulge in drugs only to maintain a normal mental and physical tone.

"The activity of the authorities in rounding up drug users and meting out to them the penalty imposed by law may be commended when it affects only the criminal class of users. But when the crusade is made general, affecting the redeemable social user the responsibility rests with the medical profession for having failed to recognize the condition as a definite disease, and to urge the employment of medico-social measures instead of penal measures in the rehabilitation of the unfortunate victims. The condition may still be remedied if the Federal Government and our legislatures would provide ample and suitable facilities for the care of the addict.

"The penal institution has never cured the drug and alcohol inebriate. Unfortunately many addicts have been initiated to the use of habit-forming drugs in such institutions, taking it principally for the purpose of creating a euphoria to take the place of the depression which jail walls produce. On his discharge from the penal institution, the addict finds himself without moral fibre or mental strength, the need of which is obvious, if he is to be restored to his normal self."

H. C. Wood, Jr.—1916.[3]

"The education of the general public as to the danger of narcotism both to the individual and to the community rests chiefly upon the pharmaceutical and medical professions. But we ourselves need to be taught our own shortcomings. Physicians must be brought to an appreciation of the fact that the too ready recourse to the hypodermic needle has led many a victim to life-long slavery. Did you as pharmacists realize the devil that lurks in the cough syrups, and other narcotic patent medicines, which you so thoughtlessly hand across the counter, you would forever banish this class of preparations from your shelves. Would you destroy the happiness, ruin both the body and the mind of your fellow-men for a few paltry pieces of silver he gives you?

"The Harrison Act exempts preparations containing less than 2 grains of opium or ¼ grain of morphine in each fluid ounce and most of the recent state laws have followed the national legislature in this regard. Nevertheless, do not try to salve your conscience with the thought that so small a quantity cannot do much harm. The most pathetic case of morphine habit I have ever seen was acquired from the use of a widely used Cough Syrup, by a man who was entirely ignorant of its dangerous character. One yellow-fever infected mosquito may not be as dangerous as ten, but it is enough to kill you if it happens to bite you; so one grain of opium may not be as dangerous as ten, but it is enough to rob a human being of his home and happiness and to rob society of a useful citizen, giving in exchange a worthless, hopeless parasite or perhaps even an actual criminal.

---

[3] Wood, Horatio C., Jr.—Some of the Results of the Harrison Anti-Narcotic Law—Jour. Amer. Pharmaceut. Assn. 1916. Vol. 5.

"I believe, however, that at present the greatest gains against this enemy can be made by proper legislation. Already some nineteen or twenty states have anti-narcotic laws harmonizing more or less closely with the Harrison Act, but there is need not only for prohibitive legislation in the remaining states but also for amendments to stop up the holes which clever rogues have found. Time fails to recount the various schemes for obtaining 'dope' which have come to the attention of the Philadelphia Narcotic Committee, and I only wish to say that the great majority of them involved the partnership—either innocently or maliciously—of the doctor or druggist or both.

"Upon us, gentlemen, rests in large measure the responsibility of awakening the nation to its peril and of directing the efforts towards its alleviation. Let us pray God we shall not be found wanting in our time of opportunity."

W. A. Bloedorn—1917-19.[4, 5]

"As long as these drugs can be obtained easily, there will continue to be a steady stream of new addicts and it is believed that one of the first steps to be taken should be the elimination of this availability of habit-forming drugs. The most stringent laws which legislators have been able to enact have failed in this respect."

* * * * *

"It is believed that the following recommendations will help in the general campaign against drug addiction:

"(1) The correction of predisposing causes as far as possible, such as overcrowding, insanitary surroundings, the lack of the facilities for healthful recreation and the prevention of contact with drug addicts.

"(2) The after care of drug addicts following discharge from hospital is considered highly advisable. A prolonged change of environment, country life, or a change of residence to avoid old associates would help to decrease the number who return to the use of drugs following discharge from hospital.

"(3) Facilities for building up these cases physically before throwing them on their own resources would be desirable as many are physically unable to secure employment immediately following discharge.

---

[4] Bloedorn, Walter A.—"Studies of Drug Addicts." Repr. U. S. Naval Med. Bull. XI. No. 3.

[5] Bloedorn, Walter A.—"Drug Addiction." Chic. 1919—Repr. J. A. M. A. Jan. 25, 1919.

"(4) Government control of all habit-forming drugs, including the manufacture, distribution, sale, and importation of all such drugs is recommended.

"It is believed that these procedures would decrease the availability of these drugs, which availability serves to perpetuate drug addiction."

Later in 1919, Bloedorn states: [6]

"It appears to be impossible to legislate drug addiction out of existence as long as the drugs themselves exist and are available. The most stringent laws that legislators have been able to enact have failed in great measure to reduce this availability. The addict better than any one else is familiar with the process of obtaining the drug. After passing through an institution for the cure of addiction he comes out with this knowledge still in his possession. If he should meet with reverses or suddenly be called on to face a trying situation, it is only natural that he should seek an outlet by a return to the drug.

"Heroin appears to be the drug most easily obtained at present; as a result, the great majority of addicts are heroin users. Also, heroin admits of easy adulteration, requires no apparatus to take, and can be readily distributed. While heroin occupies a place of some importance in the equipment of the physician, it is by no means indispensable, and it could be discarded entirely without serious results."

New York Psychiatrical Society—Public Health Committee, New York Academy of Medicine—1918.[7]

"1. We recommend that the Federal Government take such measures as are feasible to abolish the manufacture of heroin altogether.

"2. We recommend that the Federal Government be urged to adopt such legislative measure as will control and regulate the sale and distribution of opium and its derivatives and of cocaine, from the time of its manufacture to the time of its final distribution; also, that it take measures with regard to preventing the importation of these drugs except under proper conditions.

"3. We recommend that the Federal Government do not, at present, extend its jurisdiction to the control of all habit-forming drugs, but that the control of special drugs be taken up as occasion seems to demand. Experience in New York City and in the East shows that there is no great prevalence of drug habit aside from that of opium and its derivatives."

* * * * *

"7. We recommend that an attempt be made to plan some means of education of young men and women as to the dangers of habit-forming drugs. We advise against the use of 'movies' or of any sensational methods."

* * * * *

"11. We recommend that the State do not at present undertake the cure of drug addiction, because the treatment and the subsequent plan of co-operative contact required for the success is long, expensive, and difficult unless carried out in the local community itself, and the State is not now equipped to undertake such work.

---

[6] Loc. cit.

[7] Recommendations of the New York Psychiatrical Society and the Public Health Committee of the New York Academy of Medicine. Medical Record, March 16, 1918. Vol. 93.—p. 468.

"We recommend that in preference to this, at the present time, the State do what it can to prevent the development of new cases and encourage provision for the relief of present sufferers.

"12. We recommend, for the relief of present sufferers and perhaps at times for radical treatment, the use of psychopathic hospitals or pavilions and that special provisions be furnished in general hospitals throughout the State to care, under proper control, for those who ask for a withdrawal treatment. This, we think, is what is due the patient who by law is deprived of the drug.

"13. Finally, pending action by the Federal Government for the better control of habit-forming drugs, we recommend that the State of New York pass some law which will control the matter of drug addiction and the use of drugs by physicians in a better, more efficient, and more practical way than does the present law. We leave the definite solution of this as a separate problem in technical legislation.

"The plan now under consideration is to simplify the present law and make it mainly supplementary to the existing Federal law, and to issue licenses to those physicians who treat drug addicts."

A. Gordon—1917.[8]

Gordon, after reviewing the praiseworthy motives that prompted the passage of the Harrison Narcotic Act, states that only further experience can determine its practicability.

He goes on to say:

"This will be particularly observed when a legislative act is concerned with a matter of medical or other biological principles. Legislators can see only the purely utilitarian side of certain medical questions. When, however, biological principles and principles of a psychological order are to be considered, legislative acts are frequently found to be inapplicable and inadequate because of the failure on the part of legislators to consider the psycho-physical operations of an individual.

"But after the few past years of experience with the action of this law, can any one say that the desired results have been obtained? Indeed can they be obtained? Is it possible by any law to arrest a craving which is within the individual but which by the nature of its morbidity is not dependable on extraneous factors? Can a pathological mental condition which has created a pathological vegetative life be remedied by a forceful privation of a remedial agent which became a physiological necessity to this morbid life? Have the authors of the Harrison Law considered the untold suffering inflicted on the victims of the disease called 'Morphinism' by suddenly withdrawing the drug from them? Have they considered the host of torturing manifestations leading to syncope and even to death because of 'abstinence' from the narcotics after the latter have been used by the individual for some time? Has the new law provided for the great army of sufferers which are left on our hands because of their helplessness due to compulsory abstinence?

---

[8] Gordon, A.—The relation of legislative acts to the problem of drug addiction. Virginia M. Semi-Month. Richmond 1917-18. XXII. 57-59.

"Legislative acts which have for their object to prevent at the proper time the propagation of this most pernicious habit are most praiseworthy and to be encouraged. A law limiting the prescribing physician to a certain dose of the drug or to a certain number of renewals will be useful provided it does not interfere with the administration of the drug in cases in which human suffering is intense. A law that will impose a heavy penalty with imprisonment on those who sell or give away the drug without regular prescriptions or on those who forge a physician's prescription, is laudable. This is as far as legislative prophylaxis can go. It may by material force interfere with partaking of the drug by individuals who are but in the developmental period of the pernicious habit. Can it actually arrest its development? After a few years of continuous enactment did the Harrison Law succeed fully in this particular respect? I fear it did not. This is the experience of every close observer.

"But besides a legislative prophylaxis there is a medical prophylaxis whose aim is by far more important and more effectual than the first one. Its object is to investigate the physiological and especially the psychological factors which are at the very foundation of the acquirement of habit. It delves into the conscious and particularly the sub-conscious world of the individual to discover and bring to the surface those repressed wishes and thoughts, which as we know now, are constantly at work, and which are capable of directing or disorienting our acts during our entire life, and so govern our conduct as a whole. Is it possible that any legislative act and even the best one will have the power to render any assistance in this endeavor? Morphinism usually occurs in individuals with a special make-up of their nervous system. Such persons present deficiency of the intellectual and moral faculties. In them the inhibitory power becomes an easy prey for all abnormal tendencies, particularly for alcoholism, morphinism or cocainism. The latter are results of a neuropathic constitution, the fruit of hereditary tendencies. In handling such individuals one should remember Ball's dictum, to wit: 'Morphinomania is entered by the door of pain, of sexual passion, of sorrow, but also by the door of contagion, viz., imitation.'

"It is therefore evident that no law established as a revenue measure or as a matter of a policy can pretend to modify in the least degree the foundation upon which the drug addicts' psychological processes have grown and developed. It would be utterly absurd to foster such expectations. A legal regulation in matters of this sort is naturally narrow in its aims and application. It can attack only the superficial side of the problem. Speaking particularly of the Harrison Narcotic Law, there cannot be any doubt as to its usefulness, despite the many inconveniences it has created, but its usefulness, does not extend beyond the limitations outlined above. It cannot aspire to remedy conditions which are out of its control."

Institute of Criminal Law and Criminology—1917.[9]

Committee "G" of this organization in reporting upon "the principle element in the narcotic drug problem in its relation to crime" recommends the following as essential to successful control:

"What is the remedy? Punish the dealer as severely as you can, but how about the user? To lock up the confirmed user for a short period of time does him no good whatever, for he will return to the drug again as soon as he can get it. Nothing short of a year's separation from most narcotics will break up the habit. Drug victims must be cut off from old surroundings, removed from the temptations to which they succumbed, and this separation must be maintained for a long period of time, under strict discipline at first, relaxed afterwards by degrees as they regain self-control and not taken away suddenly. Occupation meanwhile is a prime necessity. Mind and body must have work. Idleness does not supply the alternative required. With idleness no cure is possible. This is the thought, of course, back of the so-called inebriate farms that have been started in one or two of our states. Drug-takers, as well as alcoholics should be put on farms, and kept there for long periods of time, and not allowed to go back to the 'tenderloins' from which they came. Some doctors will tell you that the drug-taker became what he is through an inherent weakness of character. He was, they say, a weak, worthless individual before he began taking the drug that now has such a disastrous hold upon him, and therefore you need waste no pity on him. But the fact remains that in communities where drug-taking is unknown, weak individuals neither fall so low nor become such a menace to the safety of their fellow citizens. Even assuming therefore that such doctors are right in their conclusion, we should continue in every possible manner to prevent the illegitimate sale of narcotic drugs."

J. C. Densten—1917.[10]

"Laws have been suggested and passed, with a view to lessening the evil of drug addictions. So far law has failed in its purpose. There are good laws and bad laws, effective and ineffective laws. A law which fails in its ultimate purpose is ineffective and bad. A law passed for the purpose of benefiting weak humanity is commendable, altruistic, and well meaning. But a law which benefits or cures a drug addict must have as a motive more than these attributes of sentiment; it must also contain sympathy and intelligence. A law whose ultimate object is revenue does not have philanthrophy, sympathy or intelligence behind it.

"The Harrison Antinarcotic Law exhibits to a superficial judgment the trinity of good intention, sympathy, and intelligence, but becomes perfidious in its execution and ultimate endeavor and fails miserably in its purpose. The addict is seldom benefited and the physician becomes the depositary for censure, criticism, and failures to cure through the law's unintelligence.

---

[9] Kane, Francis Fisher, Chairman. "Drug and Crime." J. Amer. Inst. Crim. Law and Criminology. Nov., 1917. Vol. VIII. No. 4.

[10] Densten, J. C.—Drug addiction and the Harrison Anti-narcotic law N. Y. 1917. Repr. N.Y. M.J. Apr. 21, 1917.

"A law to be effective in curing the drug addict must be liberal, demanding and commanding; liberal in providing eleemosynary institutions throughout the States, each with a presiding physician and a necessary number of interns, whose sole and bounded duty it shall be to use every means, method, and contrivance to effect a cure of the addiction; demanding in compelling every known addict to enter one of these institutes and not to be released until cured or dead; and commanding in holding the respect of patient and public in the choosing of physicians and interns whose qualifications shall be sobriety, sympathy, intelligence, dominant will, forbearance and honesty. This law should be a Federal law and should be ratified by each State, so that it would be nationwide. Not one addict should escape its demands, for a drug addict if not cured must have the drug, go insane, or die. It becomes as necessary for him as food. It is food to the addict."

C. L. Dana—1918.[11]

"What seems most indicated is a federal law that will make the methods of control uniform throughout the country.

"One simple and efficient measure would be a federal law abolishing the manufacture of heroin altogether. These are two courses which I would recommend.

"Furthermore, it is well established that addicts cannot be treated effectively except in institutions or in institutionalized homes. Possibly a law compelling the treatment of addicts only under institutional conditions and only by specially authorized physicians might well be passed. But at present the State is not equipped in rural districts to enact such measures."

C. Scheffel—1918.[12]

"1. Prophylaxis is the most potent remedy to eradicate the drug evil, and could perhaps be best carried out under the strict control of federal authority. Especially the manufacture, distribution, and sale of habit-forming drugs should be much more accurately supervised.

"2. A wide-spread educational campaign on the subject that includes both professional and laymen is needed.

"The public should be made acquainted with the dangers attending the use of habit-forming drugs and the intense suffering caused by drug addictions. They should also be cautioned as to what is to be avoided masquerading under the guise of cure for these addictions.

"3. The legal and medical professions should realize that the treatment of drug habits has to an amazingly large extent been left to the judgment and opinions of laymen. They should also know that some of the most popular methods for treating these addictions today are entirely empirical and are by no means based on scientific principles, or even good common sense. The average busy physician is too apt to take the misleading and extravagant advertising propaganda of those catering to this class of patients for granted without doing a little thinking of his own.

---

[11] Dana, C. L.—Problems of drug addiction. Med. Rec. 93:177. Feb. 2, 1918.

[12] Scheffel, C.—The victims of habit-forming drugs, from a medical, sociological and legal point of view. The Medico-Legal Jour. Mar.-Apr., 1918. Vol. 35. No. 2.

"Just because the propaganda and advertising happens to have gained access to the official publications representing organized medicine, does not in itself prove that the patient would be benefited thereby.

"This credulous attitude on the part of the medical profession has resulted in the country being over-flooded with institutions catering to drug addiction, many of which are conducted entirely for private gain with no idea of really curing the patient sent by the unsuspecting physician.

"Remember, confining a patient in an institution and in a few days or less taking away his drug is apt to cause unnecessary suffering, is not humane, and by no means constitutes a cure of the habit. The after-effects of such treatments have been disastrous.

"Physicians are prescribing habit-forming drugs too promiscuously for trivial causes and thereby create a large number of drug addicts themselves.

"4. Our legal brethren should assist in preventing the financial exploitation, in and outside institutions, of the unfortunate victims of the drug habit. They should aid in legislation intended to supervise and control more strictly institutions for the treatment of these addictions that are conducted by private individuals for private gain. And last but not least they should aid and assist in the enactment of laws that will ensure the poorer victims addicted to drugs of humane and intelligent treatment in those institutions where they are usually confined after a sentence by the courts.

"Appropriations should immediately become available for a thorough study of this subject. The horrors of war are creating drug addicts by the thousand, therefore let the country as a whole be prepared to care for our share of them in a humane and scientific manner when the need arises. The drug evil cannot be eradicated overnight, but it can be done in a reasonable time by proper methods. In the meantime let the government take the reins so that the half million addicts now in our midst, and those that war will create, shall be efficiently and humanely treated and not looked upon as outcasts to be either robbed or abused."

American Medicine—1920.[13]

"From a consideration of all phases of the narcotic drug problem, it is apparent that in spite of all that has been accomplished and the very real progress that has been made, the paramount need of the hour is for education, and this not alone of the people, but also of a large portion of the medical profession. The laity needs to be taught that drug addiction like the majority of human ills is an accident; that in most instances it has developed without the patient's knowledge of its nature or dangers; that it is a real disease with as definite a physical basis as any other human ailment; that it is not an evidence of mental degeneration or criminal tendencies; that it is not attended by pleasure or enjoyment, but on the contrary, almost always causes those afflicted untold suffering, misery and distress; that it is very rare to find a person addicted to narcotic drugs who would not go to any lengths to be sure of getting cured of his disease; that those afflicted deserve sympathy and pity, and not hasty criticism, condemnation and intolerance; and finally that there are many fine, highly intelligent and proud men and women—capable, hard-working individuals—who are living honorable, useful lives, but who, thru accident or by reason of some painful physical disease, have become confirmed users of narcotic drugs. Of course, there are many weak, more or less ignoble and defective people who become addicts. But it should be remembered that in many of these individuals their drug addiction is more often incidental than casual. Every community has its quota of spineless, incapable and depraved individuals who may or may not become afflicted with drug addiction, depending on their environmental conditions. By the same token, these people may or may not become tuberculous. It should be borne in mind, therefore, that when this disease of drug addiction does occur, it does not necessarily exist as either a cause or as a consequence of their mentality or general character. Nevertheless, like every other serious disease, it is a grave misfortune and the afflicted individual deserves our most sympathetic thought and attention.

---

[13] American Medicine. January, 1920, pp. 13-14.

"The medical profession also needs education, not infrequently along the same lines required by the laity, for so many doctors have kept sedulously aloof from the problem of drug addiction that they know little of the views developed during the past few years. Especially do medical men need to study the nature of addiction disease and how to combat the pathologic conditions created in the addict's body."

S. D. Hubbard—1920.[14]

"Having demonstrated certain peculiar conditions regarding the narcotic drug addict, with a study of several thousand, covering a long period, and after consultation with many well informed on this subject (and who were not in any way economically concerned except for social betterment of individuals), we concluded that narcotic drug addiction serves no useful purpose; that there is no justifiable reason at all for its continuance, and that the certainty with which this indulgence benumbs and blunts moral fibre, the practice being indulged in the majority of instances (69 per cent) by the young boy or girl, makes its control absolutely necessary. That the control is not a correctional problem from the prison viewpoint, but one for medical supervision. That ambulatory treatment is farcical and useless, and is only putting off what should be immediately done. Physicians should not be permitted, under guise of treatment, to prescribe narcotics for such indulgence. Laws should be so amended that the narcotic addict, when determined, should be sent by due process of commitment to a suitable institution and held there until a medical officer considers it safe for him to return to society. That after-care should be in an open-air environment—a farm, or outdoor gymnasium, or recreational institute being preferable and continued until the psychic phase is entirely passed, and the addict can again resume his place and maintain himself in society."

---

[14] Hubbard, S. D.—The N. Y. C. Narcotic Clinic and Differing Points of View on Narcotic Addiction. N. Y. C. Health Dept. Repr. No. 87. Feb., 1920.

"Strict, adequate, and proper as well as uniform enforcement of the law,—the Harrison Act,—throughout this city and country is now demanded, and is essential towards preventing recruits to these miserable ranks.

"The work of reclaiming the narcotic drug addict in this vicinity at least—judging from those we have seen and helped—is more than worth while.

"The clinic is not the solution—but it aids in bringing the secretive addict out of his lair. He becomes friendly disposed and, deprived of his supply, he is willing to be cured."

In another article of the same year, he states:[15]

"The control of the narcotic menace, to be effective, will necessarily not only have to correlate the professions directly interested but also secure the cooperation of all charitable and social agencies in order to work out a program for the effective administration of anti-narcotic laws, as well as the rebuilding of those unfortunate persons afflicted with the drug habit.

"Our men and women in the shops, factories, offices and homes must be properly protected from this growing evil, and all individuals and organizations should concern themselves regarding the unsatisfactory conditions prevailing and aid in better enforcement of the statutes regarding narcotic drug addiction.

"One of the very first needs is to make compulsory the reporting by physicians and others of addicts (Class 2) in order that these persons may be known and given careful and suitable consideration. Another regulation is that all prescriptions issued for opiates and cocain should be in duplicate, one for the druggist and the other for some central agency (preferably a local department of health), that the practice in this particular may be independently checked and controlled."

American Medical Association—1920.[16]

The Report of the Committee on the Narcotic Drug Situation in the United States of the American Medical Association states: [17]

"If a proper scheme of vocational guidance can be put into operation, we shall have a better satisfied and happier industrial population, with fewer misfits from this social stratum to become gangsters and narcotic addicts. And since the heroin user is young, it is not too late to reclaim him to normal and happy living by vocational guidance and training in an institution which will teach him to face a new and useful life after he is cured of his habit. The therapeutic value of vocational training has been evidenced with the cases of shell shock among the soldiers who are being reclaimed to happiness and usefulness under the direction of the federal Bureau of Vocational Education; and doubtless the same results can be obtained in the reclamation of youths who have lost their touch with reality in a less noble cause.

---

[15] Hubbard, S. D.—Some Fallacies Regarding Narcotic Drug Addiction. Jour. Amer. Med. Assn. May 22, 1920. Vol. 74 (2), pp. 1439-1441.

[16] J.A.M.A. May 8, 1920. Vol. 74, No. 19, pp. 1324-1328.

[17] According to our best information this committee was composed of Drs. E. Elliot Harris, Chairman, A. T. McCormack, Paul Waterman, and Alexander Lambert, ex-officio.

"It is already understood that much of the success of vocational guidance depends on the follow-up, even with normal children, to counteract the restlessness of youth which impels them to move on at the first difficulty. Statistics show an average of three jobs for working children in the first two years. To counteract this tendency with the cured addicts, it will be imperative to devise a wise probation system. Many an otherwise hopeless misfit can be permanently saved by the supervision of a wise and experienced probation officer, acting with authority.

"Under a proper system of classification in the institution for the after-care of the addict, it will be necessary to segregate the correctional, the mental defective, and the social misfit groups. We already have state provision for the care of correctional cases and mental defectives. The facilities may have to be increased, but the plan for care and training is already known through the work of such institutions as Letchworth Village for defectives and Elmira for correctional cases. But the problem of the misfit and of the drug user who appears normal except for the drug weakness has yet to be solved. That a solution is worth while is shown by the economic loss to the community resulting from their productive failure, their irregularity at work, and the tendency through their example toward an increase in the number of addicts.

"When addicts of these types (social misfits and otherwise normal persons) are sent to an institution where they are to be restored to normality by both mental and physical therapy, the misfit can be aided by vocational guidance, as we have shown. By a study of the addict which will include intelligence and vocational tests, there is no reason why his aptitudes may not be recognized and developed as well as in the cases of the wounded soldier who finds it necessary to change his life work. And the very interest aroused by this new occupation, together with the absorption necessary in learning a new process, will lead the addict to forget the past. When the new vocation is entered, a judicious follow-up system should be maintained lest in moments of discouragement old memories reawaken and urge a return to the old haunts and habits.

Addicts Otherwise Normal

"As to those persons otherwise normal who have become drug addicts, here we have a complicated problem. We may be dealing with a man or woman who has been doing work for which he is well trained and fitted. We may have such a person working under too great strain. Then the 'last straw' is laid on the burden, and in the altogether human search for relief, even for a few hours, the drug is perhaps taken occasionally, and the habit finally formed. The literary genius who has to finish his manuscript for the publisher; the social worker whose district must be covered at whatever cost to herself; the physician or nurse with an epidemic sweeping the city, and who must not stop—any of these may realize too late that he has become slave to the drug. What shall we do with him?

"The newer psychology has distinguished the conscious activities of the human mind from its subconscious activities—those that take place on another level, and which include lost memories, impressions from the earliest period of infancy, and the effects of shock which have expanded beneath the level of the daily activities and which have spread from one association center to another until all the activities of life are influenced by the background of experiences that can be recalled with the greatest difficulty, if at all. This subconscious life, sometimes of great intensity, has a tremendous pull on the conscious daily life. We like people because of their resemblance to others whom we have forgotten. In the domain of smell are registered impressions a thousand times as intense as those of taste. We have here a causation of likes, dislikes, attractions and repulsions whose origin we cannot understand. And buried in this part of the mind's activities is often the answer to the question why an otherwise normal person, physically well developed, makes decisions which we call regressions. Such regressive tendencies, if yielded to, mean disaster to the very soul.

"Psychoanalysis as a form of mental therapy undertakes the reclamation of this unexplored part of the ego. And here is the greatest hope for the salvation of the otherwise normal person whose will is not strong enough to shake off the drug habit.

"If, under psychoanalysis, the 'sore spot' in the individual subconscious mind is discovered and a process of reeducation begun, the theory holds that there will be released an increased energy. And then reclamation of this 'normal' addict will depend on the power he will have, under guidance, to direct this libido into higher thought and emotional levels. Studies made of individuals much given to day dreaming indicate that these dreamers have an oversensitive ego which makes their outer adjustments difficult, and thus makes for regression. The power to generalize their experiences is of the greatest assistance to these persons. And the pain of the world can be expressed in music; the longing of the world in marble, in painting, and in other creative forms. It is well recognized that man is a constructive animal, and is willing to spend himself in work in which he has joy and which brings him the respect of his fellow men. Teach this otherwise normal drug addict to irradiate and sublimate this libido which he is so wantonly wasting on the fetish of drug addiction. His strong desire is a measure of his energy. Let him be taught to direct that energy into wholesome channels which will give him as great pleasure and which will recreate his soul.

"Such is the task of the men and women in charge of the institution for the educated men and women who are drug addicts: They are to be both trained and sympathetic, wholesome and strong-willed; friends and guides into a new life in which the base desires for self-gratification is, not suppressed, but directed into new channels which will make for the happiness of the individual and the race.

Recommendations

"We therefore recommend:

"1. That the ambulatory treatment of drug addiction, as far as it relates to prescribing and dispensing of narcotic drugs to addicts for self-administration at their convenience, be emphatically condemned.

"2. That heroin be eliminated from all medicinal preparations, and that it should not be administered, prescribed or dispensed; and that the importation, manufacture and sale of heroin should be prohibited in the United States.

"3. That the bills introduced by Senator France, No. 2785, and Representative Rainey, No. 11778, to provide aid from the United States for the several states in prevention and control of drug addiction and the care and treatment of drug addicts be approved, and that Senator France, and Representative Rainey be so notified.

"4. In view of the statement in a government report that about 90 per cent of the amount of narcotic drugs entered for consumption is used for other than medical purposes, the Treasury Department is respectfully urged to continue to study and report on the narcotic drug situation, including the question of government control of these drugs.

"5. That the Bureau of Public Health Service of the Treasury Department be respectfully requested to continue the compilation of state laws and regulations relating to habit-forming drugs and bring them up to date."

E. H. Williams—1921.[18]

This author, after reviewing briefly the objects and machinery of the Harrison Narcotic Law, says that it seems to be the consensus of opinion among federal, state and county officials who are most closely in touch with the situation that after five years of enforcement the number of drug takers and the amount of drug consumed are just as great if not considerably greater than before. The closure of legitimate channels for obtaining narcotics has brought into existence an illicit traffic of tremendous proportions and without really affecting the evil we have made what was formerly merely immoral a criminal matter.

He states that from a medical viewpoint the law has the fundamental defect of not giving sufficient consideration to the underlying cause of opiate addiction as it regards it as a purely criminal act wilfully indulged in by normal individuals without considering that disease may be a cause as well as a result of the condition.

He says that the majority of cases present an abnormal mental and physical condition closely akin to insanity and the present narcotic laws present many features similar to the older legislation for the control of mental disease. He states:

---

[18] Williams, E. H.—Some Observations on the Narcotic Situation. Med. Rec., 1921. Vol. 100. pp. 140-143. No. 4.

"The opiate addict, like the psychopath, is an abnormal individual. But in most instances his physical and mental abnormalities are not apparent to casual observation so long as his system is supplied with a sustaining quantity of the drug. When this necessary stabilizing narcotic is withdrawn, however, the abnormal physical and mental conditions quickly assert themselves with absolute certainty.

"Yet even when the similarity between insanity and opiate addiction is recognized, our attitude toward the two conditions is utterly different, and is determined by the supposed underlying cause of each condition, rather than by the conditions themselves. We punish the opiate addict because his infirmity is self-imposed, just as formerly lunatics were punished because it was believed that they wilfully associated themselves with evil spirits.

"But the present legal attitude is not consistent even if we accept the dictum that the result of self-imposed vices should be punished, while unavoidable misfortunes should not. For it so happens that one of the most important and prevalent forms of insanity, general paresis, is the result of venereal vice—a self-imposed condition. At least 10 per cent of all cases of insanity are attributable to this vicious cause. Yet the law makes no distinction between paretic patients with their virtually self-imposed disease, and any other types of insane persons. The paretic is not punished, although in acquiring the specific infection which is the cause of his condition, he gratified a wilful indulgence scarcely more compelling, and generally regarded as far more reprehensible, than the craving for a drug.

"It is evident, therefore, that the cause of insanity does not influence the legal attitude toward this disease. Such is not the case with opiate addiction. A drug addict is a malefactor in the eyes of the law whether he acquired his habit through pure viciousness, or whether, as is often the case, his addiction was thrust upon him willingly, as in the case of many maimed veterans from France."

* * * * *

"The important thing about the existing narcotic laws, however, regardless of inconsistencies, is the fact that they do not appear to be getting adequate results.

"One modification of the present law that naturally suggests itself is to increase still further the scope and stringency of the statute. But it would seem that this is scarcely possible without curtailing the legitimate use of opium. And opium, bear in mind, is our most useful and most important drug. Curtailing its legitimate use would cause untold suffering among countless numbers of innocent persons afflicted with painful diseases. These persons far outnumber the addicts. So that even the complete elimination of this relatively small handful of drug habitués would be scant recompense for such a sacrifice.

"A less objectionable plan would be some slight modification in the existing narcotic laws tending to emphasize the medical side of the narcotic problem.

There is nothing novel in this suggestion. Indeed a practical step in this direction was taken in certain cities recently. For example, the Narcotic Clinics conducted in the cities of Los Angeles and San Diego for a brief period in 1920, were based on this principle, and produced results that were encouraging, to say the least.

"The Los Angeles clinic was started as a department of the Board of Health, with the approval and assistance of the municipal authorities, for the purpose of giving preliminary medical treatment to the narcotic addicts. This clinic endeavored to supply persons who required the constant use of an opiate with the necessary amount of their narcotic in gradually decreasing doses and at a nominal price. It was conducted by physicians detailed by the Health Commissioner, and under the immediate direction of a Narcotic Board composed of prominent physicians, public spirited citizens, and Federal, State, and municipal officers who volunteered their time and services.

"It was not the purpose of this clinic merely to supply the opiate addicts of the community with narcotics. On the contrary, the clinic was established for the purpose of medical treatment, with gradual withdrawal of the drug, and final cure when possible. Complete cure by this method would not be possible. in most cases, of course; but it was possible to reduce the amount of drug used, and improve the patients' physical condition so that they could be treated successfully in some suitable institution at the proper time."

Summarizing the important things accomplished by the clinic the author says:

"For one thing, illicit peddling was reduced to a minimum. When the patient could get morphine honestly for ten cents a grain, why be dishonest at ten times that price with a good chance of landing in jail into the bargain? The peddlers complained, almost openly, that they were 'being ruined' by the clinic

"To the class of persons suffering from painful afflictions, such as tuberculosis and cancer, whose condition made the continued use of an opiate an absolute necessity, the clinic was a veritable godsend, for it enabled them to procure their necessary drug at a reasonable price and in a legitimate manner. Thus they were able to reduce the amount of the narcotic, since, curiously enough, the uncertainty of being able to get a supply of the drug always tends to make the addict use more of it.

"The clinic made it possible for several individuals to engage in honest occupations for the first time in many months. Heretofore, the uncertainty of the source of supply, and the ruinous prices demanded by the peddler had kept these patients in such a state of physical dilapidation that they were unable to work. Thus the clinic enabled many of these victims to again become honest bread winners. Several of them were now able to provide for their families and again live in a respectable and self-respecting manner. And meanwhile their general health was improved by the gradually reduced doses dispensed at the clinic, and the release from the harassing anxiety about obtaining their drug."

The author thinks that the clinics should be reestablished with such modifications as are always necessary in any progressive experimental work. Hospital provision should also be made and there should be some governing body of qualified medical examiners to determine the requirements of each case. He adds that perhaps the best solution of the whole problem would be to place it in the hands of the United States Public Health Service.

A. C. Prentice—1921.[19]

"Any solution of this vexing problem must necessarily resolve itself into some plan for abolishing the total supply of drug that may be available to the addict from any and all sources. There are two main sources of supply, viz., the peddlers, most of whom are themselves, addicts; and the trafficking doctor, the narcotic practitioner, the 'script doctor' who prescribes or dispenses the drug to them for self-administration. The peddler, who deals largely in smuggled drugs, constitutes a comparatively simple police problem easily solved by thoroughgoing enforcement of existing laws. The doctor is more difficult of apprehension for he hides behind the cloth of a reputable profession, and pretends that he is treating a 'disease' when he is really selling his professional privilege in a sordid market for a very large return in money."

* * * * *

"The remedy consists in abolishing the addicts' drug supply, first by prohibiting the prescribing or dispensing of these drugs to them by physicians, under severe penalty for such violation, and secondly through vigorous enforcement of both federal and state laws dealing with narcotic abuse."

American Medical Association—1921.[20]

The Report of the Committee on Narcotic Drugs of the Council on Health and Public Instruction contains the following suggestions for the control of the problem:

* * * * *

"4. The use of apomorphin and codein rarely if ever leads to the development of addiction to these drugs. Their physiological effects are such as to preclude the probability of their becoming of any importance as habit-forming narcotic drugs. The committee recommends that the American Medical Association respectfully urge on Congress such amendment of the Harrison Law as will permit the prescribing of apomorphin and codein by physicians without the limitations which it is recognized as suitable to impose on those prescribing other habit-forming narcotic drugs.

"5. In view of the fact that enforcement of the prohibition laws is at present assigned to the same unit of the Internal Revenue Bureau of the Federal Government that is also charged with the enforcement of the Harrison Narcotic Law, and since prohibition enforcement necessitates a much larger appropriation of funds and a greater field force, and occupies a larger share of the public attention, it is feared that the important duty of efficient enforcement of the narcotic law may be neglected. Therefore, your committee recommends that the American Medical Association urge the appointment by the Commissioner of Internal Revenue of a special deputy commissioner in charge of a separate unit for the enforcement of the narcotic law, and that due prominence be given to that service in the accomplishment of its effective functioning.

---

[19] Prentice, Alfred C.—The Problem of the Narcotic Drug Addict. J.A.M.A. June 4, 1921. Volume 76, No. 23, pp. 1551-1556.

[20] J.A.M.A. June 11, 1921, Volume 76, No. 24, pp. 1669-1671.

"6. Your committee recommends that the Harrison Law be supplemented in the several states by uniform state laws, in harmony with and supplemental to the Harrison Law, which shall base their control of any medical abuse of narcotic drugs on those powers possessed by the states to punish crime as well as to revoke the license to practice medicine, dentistry, pharmacy or veterinary medicine.

"The committee recommends that it be authorized to invite the appointment of committees by organizations representing the profession of dentistry and veterinary medicine, pharmaceutical organizations, and organizations representing the various branches of the drug trade, and to cooperate with such committees, when appointed, in the preparation of a model state narcotic law; it further recommends that it be authorized to request the appointment of a Committee on Uniform State Narcotic Law by the National Conference of Commissioners on Uniform State Laws, and to cooperate with such committee, when appointed, in the preparation of such a law; it further recommends that state narcotic laws should follow the general principles set forth below:

"A model state law need not be a tax law; and in fact, the taxing feature should be abolished. Its clear purpose, like that of the federal statute, should be definitely the control of distribution of the narcotic drugs, limiting to the utmost every possible abuse, while conserving the absolute right and duty of the practitioner to exercise his judgment regarding their proper use in the lawful practice of his profession. Such state law should closely follow, and not in any way conflict with the provisions of the federal law of paramount authority. The regulations and details of administration under the two laws should, therefore, be parallel, in order to avoid confusion and to facilitate compliance therewith; and the machinery of enforcement of a state law should be as simple as possible consistent with effective operation.

"Unnecessary duplication of records under federal and state laws should be eliminated, the state accepting the records kept under the Harrison Law

"Power to make and enforce special regulations of any sort, except those absolutely necessary in administrative application of the law, should not be entrusted to state officials. Those regulations considered necessary should be submitted for approval, before being promulgated, to the State Medical Board or other professional body of competent jurisdiction, and to the Attorney-General of the state.

"A state law should embrace recognition of the clear purpose and intent of the Harrison Law, evidenced by the words, 'in the course of his professional practice only,' to prohibit distribution of narcotic drugs through physicians prescribing or dispensing them to addicts for self-administration, under the guise of administering the so-called 'ambulatory reductive method of treatment' (since such method does not constitute treatment in good faith, nor has it the sanction of professional practice). Such proper control should be the basis of both state and federal laws. This intent ought to be clearly defined in a state law, i.e., by definitely prohibiting the 'ambulatory treatment' of addiction, either by the private physician, or in institutions such as the so-called 'narcotic clinic.'

"Unlawful possession of narcotic drugs should be made 'prima facie evidence' of violation of the narcotic law, as in the Harrison Law.

"Legal commitment of addicts on their own application, as well as their penal commitment, should be made equally effective in order to insure complete control of them while under treatment for the cure of their addiction.

"Provision should be made by the state law for the treatment of those addicted to the use of narcotic drugs, in suitable institutions, existing or proposed for that purpose, or by private physicians, in either case, under the most rigid regulations.

"Institutional care and treatment of addicts unable to pay for such care and treatment should be provided for through a state law. In case special institutions are provided for this purpose by the state, the industrial colony plan will approach nearest to the ideal solution of that problem.

"All institutions should be required to maintain complete records and make annual reports to the State Department of Health, including all items called for by that body.

"Administrative provisions of the narcotic laws in each state should be assigned properly to the State Department of Health, or to a special bureau under its jurisdiction. The department of health in each state should be clothed with plenary police powers in dealing with narcotic addiction as a menace to the public, as power is vested in it for the control of communicable diseases. Public sentiment should demand their effective application.

"Penalty for violation of the narcotic laws, or narcotic addiction on the part of a physician, dentist, veterinary surgeon, nurse, druggist, or other practitioner, should include suspension or revocation of the license to practice his, or her, profession, in addition to the legal penalty for the criminal offense imposed by the court, on legal proof of such violation or addiction.

"7. Your committee is of the opinion that a study of the need for habit-forming narcotic drugs in the practice of medicine should be undertaken and pursued through the channels of the organized medical profession, as well as by the federal and state authorities. On the basis of such study, it may be determined whether or not the necessity exists, for the limitation of the amount of narcotic drugs imported, manufactured or prepared in the United States. It is the unanimous opinion of the committee that there are, at present, no available data on which could be based any practical plan for limiting imports, or for establishing a government monopoly in the importation, manufacture, preparation and distribution of the habit-forming narcotic drugs (if each plan could be legally adopted by the government, except by an amendment to the Constitution of the United States); and further, that such study could attain results of value, only after a considerable period of years, or when the members of the medical profession shall have been educated to supply accurate records of their actual needs for these drugs in the treatment of diseases and the relief of pain and suffering.

"8. Your committee desires to place on record its firm conviction that any method of treatment for narcotic drug addiction, whether private, institutional, official or governmental, which permits the addicted person to dose himself with the habit-forming narcotic drugs placed in his hands for self-administration, is an unsatisfactory treatment of addiction, begets deception, extends the abuse of habit-forming narcotic drugs, and causes an increase in crime. Therefore, your committee recommends that the American Medical Association urge both federal and state governments to exert their full powers and authority to put an end to all manner of such so-called addiction, whether practiced by the private physician or by the so-called 'narcotic clinic' or dispensary.

"In the opinion of your committee, the only proper and scientific method of treating narcotic drug addiction is under such conditions of control of both the addict and the drug, that any administration of a habit-forming narcotic drug must be by, or under the direct personal authority of the physician, with no chance of any distribution of the drug of addiction to others, or opportunity for the same person to procure any of the drug from any source other than from the physician directly responsible for the addict's treatment.

"9. Your committee recommends, in view of the fact that habit-forming narcotic drugs have definite, valuable and indispensable uses in the practice of medicine, there should be permitted no encroachment on the right and duty of the physician to exercise his judgment unhampered in the legitimate use of such narcotic drugs. Therefore, your committee recommends that the bills now before Congress which propose to limit the total amount of narcotic drugs which may be imported into the United States be disapproved, and their passage opposed by the American Medical Association, for the reason that such limitation, at the present time, would inevitably make these drugs more expensive and difficult to obtain for proper medical purposes; and that such limitation of the total supply would certainly encourage smuggling of habit-forming drugs into the United States.

"10. Your committee also recommends that the several state and county medical societies, constituent to the American Medical Association, be urged to obtain on their own initiative and through their own officers, such information as may be necessary to bring about the effective prosecution by local, state and federal authorities, of that small number of the members of the medical profession who are now acting in violation of the federal or state narcotic laws.

"Respectfully submitted by the Chairman, for the Committee on Narcotic Drugs:

Haven Emerson, M.D., Chairman,
George W. McCoy, M.D.
Thomas S. Blair, M.D.
Alfred C. Prentice, M.D."

American Public Health Association—1921.[21]

The Report of Committee on Narcotic Drug Addiction states in part:

"As a result of this study your Committee begs to report as follows:

"The group of addicts variously spoken of as criminals, degenerates and feeble-minded is unwilling and unable to cooperate in the necessary treatment, and should be kept under official control. In the opinion of your Committee, the control of this group is essentially a police problem.

"The group of addicts who suffer from physical conditions necessitating an indefinite continuance of their use of the drug constitutes a medical problem.

"Furthermore, the group of addicts in whom the clinical condition, which was the reason for beginning the use of the drug, no longer exists, or who began the addiction for other than clinical reasons, is also a medical problem. These three groups, which include all addicts, do not constitute a public-health problem in the ordinary sense of the word.

"Your Committee feels, however, that in so far as prevention of new drug addiction may be considered as a public-health problem, there are two points it would urge:

"First, that international measures leading to the reduction of the uncontrolled supply of drugs be taken.

"Second, that the importance of the education of the physician as to the dangers of inducing addiction through medical practice, and as to the best methods of avoiding such dangers be emphasized.

"In view, however, of the present unsatisfactory state of this medical problem, and of the very diverse opinions existing as to its bearing upon legislation and police regulations, your Committee believes it to be to the public interest that a research Committee of clinicians, biochemists, and psychiatrists, should be appointed with official sanction, to investigate all phases of the question and thereafter to make an authoritative pronouncement on the medical problems involved.

"Your Committee further recommends that the Executive Board of the American Public Health Association be authorized to cooperate to this end with other official bodies, should it be invited to do so.

Roger G. Perkins, M.D., Chairman,
George W. McCoy, M.D.
Peter H. Bryce, M.D."

Conference of State and Provincial Health Authorities of North America—1921.[22]

The Committee on Drug Addiction of the Conference, Dr. Oscar Dowling, Chairman, reported as follows:

---

[21] Jour. Amer. Pub. Health Ass'n, Dec. 1921, Vol. XI, No. 21, pp. 1066-1067.

[22] Report of the Committee on Drug Addiction, Proceedings of Conference of State and Provincial Health Authorities of North America. 34-36, 1919-21, p. 58.

"The factors of the narcotic problem are now generally recognized as medical, legal and sociological. The complexity involved is the fundamental reason why no law, federal or state, has proved entirely satisfactory; it is also the reason why legal enactments alone will not prove adequate. The problem is made more difficult because of the divided opinion of the physicians themselves as to whether drug addiction is a disease or a habit.

"Scientific knowledge in studies which have a bearing on the cause of drug addiction for example, studies in heredity, in functions of the internal secretions, in methods of mental examination and classification and in experiments in psychoanalysis has increased but the progress has not been sufficient to give more than suggestion for the solution of the problem.

"Without going into further analysis, the outstanding facts seem to be:

"1. The need for an international agreement and international legislation which will control the illegal importation and exportation of the habit-forming drugs.

"2. The clarification, if necessary, the redrafting of the provision of the Harrison Law which relates to professional practice.

"3. Amendment of state narcotic laws to insure accordance with the Harrison Law, and more effective methods of enforcement of state narcotic laws.

"4. The separation of the narcotic agencies from Prohibition enforcement in the administration of the Harrison and Prohibition Acts.

"5. An intensive educational campaign that the public may become better informed relative to the danger of acquiring the habit and the menace which drug addiction is to our people."

In 1922 the same Committee reported as follows:

"The recent orders issued by the Treasury Department assigning every agent in its service to assist in narcotic work are evidence of unsatisfactory progress in the control of the drug evil.

"The Government evidently thinks it wise to extend its operations for further control of smugglers and traffickers in narcotics.

"As was suggested in the last report, the complexity of the problem explains why Federal and State laws have proved inadequate; also, why their enforcement is so difficult. Some progress has been made toward enlisting the assistance of other countries in the control of smuggling of drugs into the United States. Cuba, Mexico and Canada have promised cooperation to prevent, as far as they can, this illegal traffic. Control of importation from these sources would lessen to a degree the quantity of the drugs imported, but this cooperation would have to be extended to European or even Asiatic countries if the supply of narcotics is to be controlled to meet only necessary medical requirements.

"It is the conviction of the Committee that many physicians are more careful in the prescribing of narcotics, and that the rulings of the Federal Courts are more drastic as to penalties.

"From our experience in the investigations of two years it does not seem pertinent to go into a more detailed analysis, but to recommend what seems to be most practicable.

"Whereas: The importation of opium and coca leaves and their derivatives is greater in amount than is necessary for proper medical requirements and a great proportion of such importations is illegally sold and distributed; and

"Whereas: The lack of cooperation between federal government and the states and the absence of proper and effective state legislation throughout the country has made possible the abnormal growth of the illicit drug traffic, therefore be it

"Resolved: That this Committee urgently recommends that Congress pass such legislation as will provide for proper and effective federal regulation of the importation of narcotic drugs and of the sale and distribution thereof, to the end that sufficient quantity thereof may be available only for proper, legitimate medical purposes, through the establishment of properly regulated distributing agencies; and be it further

"Resolved: That copies of these resolutions be sent to the President of the United States, the Vice-President, the Speaker of the House of Representatives and Senators and Representatives in Congress."

In discussing the above report, Dr. Fulton of Maryland questioned the wisdom of involving executive state health officers in a confusion between the powers of the health officer and the police power as they are generally understood.

Dr. Turner of Washington stated that he believed the narcotic evil to be a menace to public health and that every state health department had by law jurisdiction over the public health. He goes on to say:

"So the whole situation comes down to two points. First, the control of the drug. Make regulations that it cannot be sold; and that will probably be taken care of if the President signs the Jones-Miller bill which has passed the Senate and is now up for the President's signature. This bill has been fought for tremendously by the press and prominent individuals in the State of Washington as well as Oregon. The White Cross has also been very active and we hope that the enactment of the Jones-Miller bill will terminate one phase of the problem. Of course, it will necessitate using some of the power of the police department, a whole lot of it perhaps, but primarily narcotic drug control is a public health matter, and we have got to have in any public health matter police cooperation.

"The other thing is that the addict himself must be taken care of. It is quite true that it will be a waste of money to try and take care of the addicts under present conditions. As soon as we can get a federal law that will make conditions possible so that the addicts may be treated efficiently, then the community will have to prepare itself to give them this treatment and bring them back to normal citizens.

"The present distribution and consumption of drugs is going on so insidiously throughout our population in the west that I cannot tell you how serious the matter is. There is a White Cross in our section—a tremendously enthusiastic organization; I think the activities of the organization together with the work of the health authorities will bring about much better conditions throughout the country. I want to appeal to you to promote the White Cross in so far as you are able."

Dr. Nicoll of New York agreed with Dr. Turner stating:

"It is a matter which we have had on several occasions to bring before committees of the State Legislature during hearings on bills for Narcotic Drug Control. It may be conceded that indirectly narcotic drug addiction is a matter with which public health authorities should concern themselves, but I believe that the control of the manufacture, selling and dispensing of narcotic drugs is a function which can no more logically be assigned to health authorities than that of the enforcement of the Volstead Act for the control of alcoholism. These are primarily police matters and I speak from experience of one year during which the State Health Department was given legislative control of narcotic drugs in warning you to make every effort to prevent such prerogative being forced upon you by legislative action. You will accomplish little or nothing and what you do accomplish will be at the expense of strictly public health work."

Dr. McCormack of Kentucky stated the following:

"As a member of the Committee on Resolutions I would be very glad to hear a discussion of the committee report because I would like to be advised by members on their views in regard to this important matter. My own experience is so directly contradictory to that of those who have spoken on the subject. I feel that in our state, while the evil is comparatively a small one, we have not accomplished such definite results from the exercise of police power as through the health department. I am a little surprised at the trend of the discussion. We have found that there are two great sources of this evil as far as its initiation is concerned. Indeed, in going back, it is the constitutional psychopathic state that underlies the whole thing, and I believe Dr. Nicoll's reasoning is not right, showing that the constitutional psychopath is not relieved either by the administration of the drug or the withdrawal of the drug or by any other means. But the drug addict can be cured whenever you stop the supply of the drug, and that is the only way he can be cured."

* * * * *

"I know we are getting results. There is no question about it. It is not a matter of petty offences but a matter of stopping the supply of the drug. The experience I had in Panama is of value so far as this country is concerned and I believe the plan adopted there would control the narcotic drug in the United States. The health department had all the drugs supplied and we furnished the doctors with doses in the original containers. They brought the original containers back when they wanted a new supply. That way nobody else got it. I believe its supply should be controlled in the same way as alcohol, morphine, cocaine, etc. In the meantime certain manufacturers and commercial houses in this country that are manufacturing the drug knowing it is supplied illicitly ought to be put in the federal penitentiary. Until that time comes and big business knows it cannot sell, the traffic will not be controlled. That is a federal matter entirely and should be attended to as a federal matter, promptly."

Dr. Crumbine of Kansas addressed the following question to Dr. McCormack:

"I would like to ask Dr. McCormack if after all he is not operating a board of examination and registration in connection with the state board of health? While I am on the floor I would like to add my word of caution and protest to what Dr. Nicoll and Dr. Fulton have said. On a number of occasions the matter has been checked up by the state legislature and I have very vigorously opposed any such measures as giving this responsibility to the state board of health. I can see where the combination of the board of examination and registration with the board of health might alter conditions but that goes so far that I doubt very much whether the state boards of health should attempt to exercise such police measures."

In reply Dr. McCormack stated:

"I am very glad indeed to answer Dr. Crumbine's question. A state board of medical inspection and examination that is not in the state board of health is not a nominal and economic system and I hope that it would be abolished. The public has no interest in the medical profession except in so far as it promotes public health. There is no reason for the state board of examination to be in existence, no more than it would be to have a state board of registration for plumbers, or locomotive engineers and firemen. I don't believe in any of them only in so far as they protect the public welfare and public weal. I believe the state health departments are doing everything to promote public health. We are attempting to protect our people from doctors furnishing poison in water, food, or any other way which would affect the health of the people. I believe that the state board of health should take proper action in this matter."

The report of the Committee was accepted and the resolutions were referred to the Committee on Resolutions for redrafting.

J. W. H. Crim—1922.[23]

"As a practical condition, the Government situation is this: The conscientious physician is loath to and often will not prescribe for the addict; the addict is, therefore, in many instances practically unable to get the narcotic legitimately. He is driven by the cravings of an appetite, frequently excruciating pain (if he has been denied a narcotic for a considerable period of time) into criminal associations, wherein he can procure it only by the commission of crime. Once started on this downward path, he is ultimately apprehended and prosecuted as a criminal. Not infrequently he arranges a fictitious sale in the presence of an officer of the law, that he may be convicted, with the hope that incarceration may cure him. Once in prison, with the brand of felon, in association with other addicts, and the opportunity to obtain it within prison walls, any degree of correction, reformation, or cure, is a remote probability. The fact is on serving his sentence he is invariably a greater liability to society than before conviction."

---

[23] Crim, John W. H.—Narcotic Addiction in the United States. Printed for the use of the Committee on the Judiciary. Senate Committee Print. 67th Congress. 4th Session.

* * * * *

"Concretely, I submit that any solution of this problem must have for its basis a demonstrated policy from the medical profession.

"Government must provide some asylum for the unfortunate addict that the present conditions, which too frequently drive him into criminal associations, and ultimately crime, may be brought to an end. The door of hope must be kept open.

"Local self-government throughout the country must see to it that the local officials make better efforts to destroy the illegitimate traffic in each community.

"The United States Government must give greater consideration to the prevention of the introduction of narcotics into this country, by more intense policing of the harbors and seaports. These sources—these gateways to the channels of this trade must be closed.

"The Government, by international agreements and treaties, must see that this traffic is outlawed throughout the world and no narcotic manufactured anywhere, except under the eyes of the visitatorial power of a responsible government.

"With the criminal addict, I have this suggestion, in so far as the United States Government is concerned, that Congress immediately enact into law the bill submitted by the Department of Justice for the taking over of a part of the Government reservation at Camp Grant and creating there an industrial reformatory, where first offenders between the ages of 17 and 30 (not guilty of the more heinous crimes of treason, murder, rape, or arson) may be sent and taught the rudiments of a grammar-school curriculum and a useful trade under sanitary conditions. This will relieve the congestion with which we are now confronted in the Federal prisons, and which, I wish to assert with all of the emphasis I can command, is rapidly resulting in conditions so immoral as to be a stain on and a disgrace to the American Government."

R. G. Perkins—1922.[24]

"1. As noted earlier, there is no hope of checking the underground traffic without international agreement.

"2. The present laws show the disposition of all drugs legitimately obtained by the physician.

"3. If the smuggled supply were unobtainable, the only source for the underworld supply would be thefts from legitimately obtained supplies.

"4. It is generally agreed that this would be a small matter and in no way competent to supply the peddling trade.

"5. The percentage of dispensers of legitimately obtained drugs who cater primarily to addicts is small and easily ascertained.

---

[24] Perkins, R. G.—The present situation with regard to narcotic addiction in the United States. Illinois Medical Journal, 1922. Vol. 41. pp. 44-47.

"There are really two problems, one for the future, one for the immediate present.

"Granting the removal of the underground trade through national agreement, and adding to this the time-worn factor of education of the medical practitioner to prevent the type of addiction for which he has been responsible, it is clear that the addiction of the future generation, as far as opium and its derivatives are concerned, would not be serious.

"For the present, however, the problem is more complex. We cannot get international action all at once. We cannot develop adequate hospital facilities all at once, and if previous contentions are accepted, mere hospitalization without convalescent care would be unwarranted expense.

"The mere forbidding of an action without removal of the means to carry out the action has never been more than temporarily successful, and it is well known that the best of reforms occur in waves, with long intervals between waves.

"In reality, how serious is the condition, and how much of a menace is it? In the earlier propaganda, the percentage of our population who were addicts was placed as high as four per cent. Now it is claimed as affecting one-fourth of one per cent or less, a notable drop, and one not claimed as the result of the execution of the law.

"The great majority of the addicts who may be considered as a public menace are in the large cities, and according to such statistics as we have available, are for the most part in the criminal classes. Inasmuch as addicts of this type are resistant to all treatment save by force, the only way *they can be* cared for is in correctional institutions, in which they may be retained until detoxicated. At least this portion then may be considered as a police problem rather than as a public health problem.

"If this is true, the fact that the reason for relapse is the accessibility of the drugs through peddlers brings us back to the same point in the circle, namely, the checking of smuggling and its checking by the only possible means, removal of the foreign source of supply.

"If the peddlers' supply were limited to thefts from registered stocks, it would certainly be insufficient to spread addiction, even if it was adequate for the present group. The problem would be self-limiting, far more than would even adequate hospitalization and after-cure.

"In summation, it seems to me that the solution for the future lies primarily in the international limitation of the sale of opium products to registered and responsible persons, and secondarily in the education of physicians and the public as to the development of addiction.

"The solution for the present is far more difficult. The supply is accessible, there is no adequate hospitalization in sight, the educational side is incomplete. There is little disagreement among reputable persons as to the disposition of most of the cases. The main argument concerns the interpretation of the proper control and treatment in a limited number of individual cases. There are, it seems to me, two main points of difference. First, can the physician be trusted to play fair with the law? Second, is the number of such cases and their relation to society a menace?

"Decisions and recommendations must be made on the basis of facts. It does not appear likely that further investigation will do more than to increase our statistical knowledge, and fill out the records of types and cases. The only point under serious dispute which may be cleared up by scientific investigations, and which should be most carefully studied, is the classification of addiction as a disease or as something else. Until this is done in a manner sufficiently clear to carry conviction, the present argument will continue."

Suggestion for Model State Law—1922

There was held in New York City in March, 1922, a conference of a committee appointed by the chairman of the Council on Health and Public Instruction of the American Medical Association with representatives of the American Drug Trade Conference, various pharmaceutical organizations, the American Veterinary Medical Association, and the Narcotic Drug Control League. The purpose of the meeting as stated by the chairman, was, "to see whether we can come to an agreement in respect to uniform State laws which shall supplement the Harrison Act in order that there may be unanimity of professional and trade co-operation back of the narcotic law."

The "model" law which was considered at this conference, followed in the main the provisions of the Harrison Act and certain regulations thereunder. The chief points of difference are included in what follows:

Section 6, (2), provided that prescriptions containing codein or a preparation containing codein, could be refilled. This variation from the Harrison Act is explained in a footnote as follows:

"This provision is at present contrary to the regulations now in force under the Harrison Act and is approved subject to revision of the regulations by the treasury department to conform to this provision of the proposed State Model Law. The conference expressed its belief that every effort should be made to obtain modifications of the existing treasury department regulations so that there may be agreement between them and the proposed text of the model law."

Section 10 required a physical examination to be made by a physician, dentist, or veterinarian, prior to the prescribing or dispensing of habit-forming drugs.

Section 13 specified that the records required to be kept under the provisions of federal law, should be considered sufficient fulfillment of the requirements of the Act.

Section 14 provided for the revocation of licenses of physicians, dentists, veterinarians, or apothecaries for ". . . wilful violation of any of the provisions of this act," and that a copy of the sentence and of the opinion of the court or magistrate be sent by the clerk of the court or by the magistrate, to the board or officer having power to suspend or revoke the license or registration of the person convicted.

A penalty clause, the enforcement authority, and the administration of the Act in general, were not designated in detail, in order to permit in each state the adoption of such provisions as might be customary.

The action of the conference with respect to the law, was as follows:

> "RESOLVED: That the draft of the result of our deliberations as embodied in sections 1 to 17 as amended be submitted to the respective organizations represented in this conference for their consideration and for such disposition as they shall respectively deem appropriate."

The narcotic law passed by the New York State Legislature in 1927 was based on this law, but did not contain all of its provisions.

L. C. Scott—1923.[25]

> "Whatever be the reason for contracting an addiction to morphin, heroin, or cocaine, the fact remains that those persons caught in the toils are most unfortunate. Is there an element of justice and humanity in making it impossible or even difficult to get their necessary drug and driving them into the clutches of the conscienceless drug peddler? Is society benefited in trying to stop one evil by creating another; by stopping the bung and opening the spigot? This suggests that there must be the possibility of a common ground upon which the medical and legal professions can meet. After all this is the crux of the difficulty. A large part of the controversy and misunderstanding in which the narcotic situation has been and is still involved, is dependent upon the fact that the lawyers and doctors cannot interpret it in the same way.
>
> "As lawyers look at the matter, the enforcement of the anti-narcotic act is the paramount issue. The act was framed, according to their views, primarily for the protection of society against the criminally inclined and the mentally defective, whose slavery to narcotic drugs makes them doubly dangerous members of this society. In short the administration of the Harrison Anti-Narcotic Act virtually penalizes the addict as a criminal and as a degenerate which, with a large proportion of addicts, is undoubtedly not the case."

* * * * *

> "Theoretically the rôle of the law is to make it impossible for addicts to get their supply of drugs; it makes no distinction between criminal and non-criminal; it is oblivious to suffering; it takes no cognizance of nor makes provision for

---

[25] Scott, Leonard C.—Acting Ass't. Surgeon, U.S.P.H.S.—The Case of the Drug Addict. Quar. Bull. La. S.B. of H. Mar., 1923. Vol. XIV. No. 1. pp. 14-18.

alleviating the economic side of the addicts' problem; it sees the mass but not the individual, the forest but not the trees; it is blind and solves with a common denominator. In contradiction to this attitude stands the medical viewpoint, the physician receives the human wreckage from the legal battle to patch up and make whole if he can. His motives are humane, as they must necessarily be if he is what society expects him to be, and if his training and occupation have not dulled his ability to sympathize with suffering humanity. He cannot grasp, as a lawyer apparently can, that a law devoid of the elements of humanity can be framed. He sees the addicts as sick and suffering human beings who must be cared for and, if possible, cured of their malady. He is interested more in the individual than in the mass; he cannot see the forest for trees.

"One phase in the ultimate solution of the addicts' problem is clearly a medical one. It is obviously the duty of the medical profession to devise means to meet the emergency produced by the enforcement of the Anti-Narcotic Act. Consider that the addict, of whatever social standing, becomes a liability and a menace to a greater or lesser degree when deprived of his drug. Add to these sufferers from painful and incurable diseases whose appeal is solely one of humanitarianism, and the sociological and medical aspects are at once apparent. All must be cared for sooner or later, whether they finally land in the jail or in the hospital; there is no evading the issue. At present, the individual physician must determine the condition of the patient and take responsibility of prescribing or the sufferer continues to be the prey of the peddler.

"Pertinent to both the legal and medical viewpoints of the narcotic problem is the question which is so often asked and so often evaded—'Is drug addiction merely a habit or is it a disease?' The confusion and difficulty in answering this question is due to lack of definition of terms, what is meant by 'habit' and what is meant by 'disease.' According to the Century Dictionary a 'habit' is a customary mode of action which is instinctive, unconscious and uncontrollable. 'Disease' is a deviation from the healthy or normal condition of any of the functions or tissues of the body.

"Huxley's definition is even more broad and comprehensive. He says 'Disease is a perturbation of the normal activities of a living body.' If we concede the truth of the following premises; viz: that morphinism or drug addiction is a customary mode of action and that furthermore it is uncontrollable, we must also accept the conclusion that it is a habit and, secondly, we must agree that inasmuch as disease is deviation of the normal functions of the body, and that the manifestations of drug addiction indicate at once that these functions are disturbed, we must conclude that it is a disease. Therefore, it is both a habit and a disease, but arguing by analogy we can easily prove that habit may readily act as the provocation of disease. For instance, epithelioma of the lip or carcinoma of the tongue are assuredly diseases. It is possible that they may owe their origin to pipe smoking. But pipe smoking is a habit, therefore, lip and tongue cancers are habit diseases. Again over-eating may lead to a long series of organic defects, including arterio-sclerosis and an apoplectic stroke. Over-eating is surely a habit, and an unnecessary one. Its logical outcome is arterio-sclerosis and apoplexy, that is disease and its manifestations—ergo, habit diseases.

"Another point of view which seems equally as logical is that the state called 'morphinism' or 'drug addiction' is one in which the body finds itself when its physiology is disturbed without the administration of some foreign substance not normally necessary. In the sense of the above definition this constitutes disease, for without morphin, which is beyond a doubt an abnormal substance in the metabolism of the human body, there is 'a deviation from the healthy and normal condition.' Let any one look at an individual suffering from withdrawal symptoms and argue that the bodily functions are intact.

"Another contention that morphinism is not a disease is that there are no pathological changes visible. In short, it is a habit because the microscope does not reveal cellular alteration. Has any one detected cellular alterations in the earlier stages of hebephrenic dementia or paranoia, or hysteria? But who will question for one moment that they are manifestations of disordered bodily functions, and therefore disease entities?

"Then we come to the conclusion that it is neither flesh nor fish, yet sometimes one, sometimes both; either a habit or a disease or finally a diseased condition caused by a habit which has become fastened upon the body because of disease. We argue in a circle, grasp fallacy after fallacy and in the end are little wiser than when we commenced.

"But all this does not alter the status or the suffering of the drug addict who cares but little for physiological distinctions and nothing for logical discussions. He is a fait accompli; he is there and asks what are you going to do about it? He says: if you don't help me I shall suffer the torments of the damned and I shall make it increasingly unpleasant for you if you don't try to do something. I am not only the victim of myself but I am also the bond-servant of the drug peddler. You will not assist me and you cannot suppress him. You are the society which is responsible for my being, and yet in my misery you turn a deaf ear and ignore me completely. You may arrest me, and punish me as much as you will. It is your prerogative because you are the stronger. But you will add one more vindictive and implacable enemy to the hundreds which are already undermining your existence. Help me to get out of this slough of perdition, to become a useful member once more. Pursue a relentless war on the fiendishly cruel and rapacious drug vendor; co-operate with foreign governments to prevent the illicit traffic in narcotics and though it cost you millions in money it will not only be doing an act of justice but it will repay you richly when the final reckoning comes."

Nation's Health—1923.[26]

"The widespread prevalence of drug addiction constitutes a situation which may well provoke serious thought on the part of the profession of preventive medicine. It is no exaggeration to state that we are face to face with a condition which, if uncontrolled, may tend to undermine the very foundations of civilization itself. So serious is this threat that half-way measures will not do; the circumstances are such as to call for drastic and thoroughgoing measures. These are not the alarmist beliefs of fanatical reformers, but the sober judgments of capable physicians, wise jurists, and well-balanced men and women who know from personal experience and observation the way in which the great army of drug addicts is being recruited daily and the misery and degradation which is thus produced."

---

[26] The Nation's Health—Public Health Aspects of Drug Addiction. Editorial. June, 1923. Vol. V. No. 6. pp. 366-368.

* * * * *

"Great international organizations have been formed for the marketing of narcotics. They ruthlessly violate any law of God or man to carry on their debasing trade. They fearlessly corrupt customs officers, the police and the very courts themselves in order that their contraband may reach and destroy the consumer. Certain physicians have even so far prostituted their professional standards as to become panderers to habitues, and men of responsibility in the community have so yielded to the pressure of the dollar that they have protected drug peddlers from punishment by the law. From the fields of Turkey, Persia and India . . . out to the ports of the world, to centers for the distribution of the drugs, to the scoundrelly vendors and their unfortunate victims, there runs a sinister line of bribery, smuggling, bestiality, deception, and murder, energized by lustful avarice and greed.

"Up to date these dark forces have been largely combated by a small group of practising physicians, the legal machinery of the Federal Government and of the various states and municipalities, and a few public spirited volunteers. In a few instances these leaders have been assisted by public health workers. They have not always displayed the greatest wisdom in their well-meant efforts, but they have honestly and whole-heartedly pitted themselves against this octopus which is stretching out its tentacles into every walk of life and every stratum of society. This group is dealing with end results and consequently is failing to affect materially the elemental cause. There is a very genuine public health problem here and it is our duty to attack courageously this mental disease which menaces industry and public safety, which has invaded our hospitals, asylums, and penitentiaries and has even made serious inroads upon the army and navy. Once largely confined to the criminal classes, it is now not uncommon to find the vice in the higher walks of life and, worst of all, it is claiming as its victims many youths and adolescents. The disease must be regarded as a highly communicable infection since one of its outstanding symptoms is the desire to induce others to acquire the habit, and like other dangerous contagions, it must be fearlessly attacked and eradicated.

"This is not to be done easily. There is no universal panacea for the cure or the prevention of the drug habit. It is a secret mental vice which does not show itself early in the faces or comportment of its followers. It is easily contracted, and if followed for a single week may fasten itself firmly upon the unwary. It is difficult to cure, relapses and reinfections being frequent. The dope-fiend is a potential criminal from the beginning and brooks no restriction which will prevent him from his eventual self-destruction. The forces which are producing and marketing narcotics are strongly entrenched and they will not draw back from any crime in order that they may continue their profitable occupation.

"We may, and we must, arrest, prosecute, convict and punish; we may, and it is our duty, to treat the miserable habitues; we may propagandize in the hope of securing prevention through education; we may, and we should do all these things wholeheartedly, but we may do them until the end of time and never make any real progress. Just so long as there is not an absolute control of the production and sale of drugs there will be weak men to crave them and scoundrels to sell them. The place to cut off a snake's tail is just behind the ears. The place to attack this international menace is at the source, to control the raw products at the plantation, to regulate chemical works and their output to the extent that every grain of a habit-forming drug is accounted for up to and including the point where it is administered by a physician to meet an undoubted therapeutic necessity."

"Under the system developed by modern banking it is possible to transport and deliver money to any part of the world with scarcely the chance of a single loss. The same sort of system should prevail with regard to the habit-forming drugs. It is possible to put it into force if the nations of the world will get together and rigorously carry out a united policy. The Hague Committee tried to bring about such an arrangement and failed. The League of Nations now has a board sitting to formulate plans with the same object in view. The United States has sent observers to the meeting apparently to lend the moral influence of an onlooker sitting on the fence. Whatever may be our views regarding 'entangling alliances' this is no time to be hanging back timidly. The international traffic in dangerous drugs is not a political question, it is a great health issue. It is an affair of the greatest possible moment. It is a responsibility which, if dodged by us or if not met in the open by our people, is going to do us an infinitude of damage. We cannot sit by as critics. We must get into the fight instead of telling the other nations what they should do and how they should do it. It is just as much our fight, just as much of our interest as would be a devastating plague epidemic in Europe, Asia or Africa. The civilized world must combine against this menace and we must not be too proud to fight an enemy which threatens the integrity of civilization."

Henri Claude—1923.[27]

After commenting on the lack of hospital facilities for the treatment of cases, the scarcity of physicians experienced in the handling of these cases and the undesirability of treating them in hospitals for mental diseases, the author says:

"There is here a void that would be filled by the establishment of mental hygiene dispensaries connected or not with psychiatric hospitals and of free services which would provide for the voluntary treatment of cases without complicated administrative red-tape and thus make treatment by competent physicians available. The results following the withdrawal could be made permanent through dispensary supervision with social visitors to watch over the environmental conditions of patients. Those who were found to be relapsing could be quickly supplied with medical help and moral support—both of which are now lacking.

---

[27] Claude, Henri.—Sur quelques poisons sociaux; la morphine et la cocaine. Révue Scientifique, 1923. Vol. 61. No. 16. pp. 509-515.

"In conclusion, prophylactic education, by preventing the spreading of the evil, will diminish the number of cases and the mental and social assistance through such mental hygiene services and dispensaries will finally assure the competent handling of these cases.

"In France, particularly in Paris, thanks to the Mental Hygiene League and of its devoted president, Dr. Toulouse, the fight against drug taking is about to enter a phase of accomplishment."

William G. Somerville—1924.[28]

"Who is responsible for the care of this immense array of narcotic drug addicts, what should be done for them, and what measures can be recommended to prevent or even limit future addiction?

"A few seek relief in private sanitaria, where they can be received only on voluntary admission and can leave when they please. This is always before they are sufficiently recovered, as there is no law by which they can be held, and frequently they have not the means to enable them to remain longer.

"The majority of addicts are financially unable to obtain private treatment. There are a few places in some states where they are treated in the city hospitals for a short period, but not long enough to hope for permanent results. Many are committed to county jails and workhouses as vagrants or on some technical charge, though they are not criminals nor are they vicious.

"Twenty states have passed laws forbidding the physician's giving morphin to a drug addict and specifying that he go to a hospital for treatment. This would be an excellent law were he financially able to bear the expense of treatment in a private sanitarium, or were provision made by the city or state for his care and treatment. But public provision for his care is very limited, in most places not obtainable, and in any case he cannot legally be held long enough to do material or permanent good.

"Our contention is that drug addicts are suffering from a malady, a disease, which absolutely unfits them for their work or else reduces their efficiency to a marked degree; that a large percentage are curable with proper treatment, and the proviso that it be made impossible for them to procure the drug; that it is the duty of the state to make provision for the care and proper treatment of all drug addicts; that they are entitled to it as much as the insane (but that they should not be treated in the same institution as the insane). Their commitment should be compulsory.

"If we were to have institutions in every state capable of caring for all addicts, the solution of the problem would not yet be accomplished. There is a menace with which it is difficult to cope. That menace is the peddler, and along with him we would place the druggist and physician who sell morphin to addicts or write prescriptions for them. Until we get rid of these, 'cures' are frequently temporary or in vain.

---

[28] Somerville, Wm. G.—Who is Responsible for the Drug Addict? Chairman's Address, Section on Neurology and Psychiatry, Southern Medical Association, Washington, D. C. Nov. 12-15, 1923. Discussed by Drs. M. A. Bliss, M. L. Graves, E. Bates Block, Beverly R. Tucker, Tom A. Williams, and Percy D. Hickling. Southern Medical Journal, Feb. 1924. pp. 108-112.

"The peddlers' trade is dependent upon supply and demand. It has been suggested to limit the supply by restricting the amount of the poppy grown. This would require international cooperation and would strike at the very root of the evil. On the other hand, if the commitment of all drug addicts were made obligatory, then the demand would necessarily be diminished or abolished according to how complete were the results of the commitment.

"In addition to this, bootlegging, whether in the ordinary manner or by a druggist or physician, must be made, by statutory enactment, a very grave offense, punishable not by fines, but by a long period of imprisonment.

"The summary of our conclusions and suggestions is:

"(1) Strike at the source of supply and by international cooperation limit the growth of the poppy.

"(2) Eliminate the importation and manufacture of heroin, for which there is no need as a medicine.

"(3) Educate physicians and the public to the fact that narcotic drug addiction is a disease per se, and not a vice.

"(4) Let each state establish special sanitaria, where addicts, either by voluntary treatment or compulsory commitment, may receive treatment from skilled physicians.

"(5) Eliminate all illegal channels of supply by proper Federal supervision and drastic laws entailing long terms of imprisonment for bootleggers and all violators of the Harrison narcotic law."

S. A. Knopf—1924.[29]

"There are certainly not a million diabetics in this country, and yet with what justifiable joy did we not greet the great discovery of Banting and how eager are the medical centres to teach the administration of insulin! Courses are offered to the general practitioner for acquiring the latest knowledge on the treatment of diabetes mellitus by means of dietary regulation and the use of insulin.

"Why cannot something similar be done on behalf of the one million or more drug addicts? The law which forbids the private practitioner to treat the drug addicts for a longer period than thirty days, and only permits continuous treatment in special institutions, is absurd, at least at the present time, in view of the large number of addicts and the small number of institutions. Granted even that Commissioner Simon's statement that sixty-five per cent of those arrested as drug addicts had a record on file in the Criminal Identification Bureau of the New York Police Hospital, should not be applicable to the entire country, the problem is nevertheless a criminal and social one, as well as it is a medical problem, and by its vast distribution, not a local, state or national, but an international problem.

---

[29] Knopf S. A.—The One Million Drug Addicts in the United States. Medical Journal and Record. Feb. 6, 1924. pp. 135-139.

"In addition to the suggestion mentioned above, to appoint a commission to outline the best possible treatment for the narcotic addict and to deal with the problem of the cause and prevention, etc., I would make the following additional suggestion so as to avoid the possibility of even only an occasional unscrupulous physician abusing and violating his privilege by prescribing for drug addicts for financial gain. The commission should be authorized to grant special licenses only to such physicians who have, by their studies and experience, proved themselves to be competent to treat drug addicts. These physicians should be obliged to keep careful records of their narcotic cases and their methods of treatment, and the records should be subject to examination by the commission referred to. The county medical societies are perhaps best qualified to designate the men who by reason of their reputation and learning should be recommended to the commission as especially equipped for the treatment of drug addicts.

"What an opportunity for our government or our great benefactors, the Rockefellers and other philanthropists, to be helpful in this work by giving financial aid in creating such a commission and such urgently needed courses in the best and most approved methods of treatment of narcotic addicts. Of course, there probably will have to be created many more institutions for temporary voluntary or compulsory confinement. Research bureaus and laboratories will also be necessary. The urgent need of an energetic combat of the problem in all its aspects is obvious."

* * * * *

"In these international conferences the United States should take a bolder attitude and announce a policy of full cooperation in maintaining and operating the only international machinery for this purpose now in existence. In my opinion, one or two of our leading medical men representing the physicians of this country should be sent to that conference, besides the federal representatives already there. Our profession, which is unjustly accused of fathering the narcotic problem, should be the first among those who are eager to combat it."

* * * * *

"Over a million drug addicts, many of whom are already confirmed criminals, in a population of one hundred and ten million is a fearfully dangerous and alarming situation. It will require the combined action of wise governments, enacting and enforcing rational antinarcotic laws, well trained physicians and experienced social workers, numerous special and well supervised institutions for the sanatorium treatment, large-hearted philanthropists who will help to defray the expenses of so vast an undertaking, and lastly, but above all, education of all the people to the fearful consequences of drug addiction."

New York State Commission of Prisons—1924.[30]

The special committee appointed by this commission in its report makes the following suggestions for the better handling of the problem:

---

[30] New York State Commission of Prisons. Special Report on Drug Addiction, December 2, 1924.

"A Remedial Program.

"The narcotic drug evil is so widespread and insidious that the most strenuous and united action will be necessary to control it. So long as large commercial profits can be made off the weakness, folly, ignorance and misfortune of men, attempts, more or less successful, will be made to evade the laws and efforts for its regulation. Education, medical and lay, regulatory and sane laws, social welfare work, scientific medical treatment and justice have been the most effective agencies and forces in combating social evils, and to them society must resort for protection against the drug problem.

"I.

"Education.

"A careful educational program should be formulated which will present to the public the evils of narcotic drug addiction. School authorities should be advised to teach the facts in the schools and warn the young of the destructive nature of the disease. Educational campaigns have materially reduced the number of the victims of tuberculosis and venereal diseases. Possibly some organization or foundation will undertake such a campaign against drug addiction.

"More education is desirable in the training of the medical profession for the treatment of drug-addiction disease. The average doctor is astonishingly uninformed on the diagnosis and prognosis of the disease. Medical schools should give its study more prominence and doctors be trained in its specialized treatment.

"II.

"A State Law.

"New York State should enact a State-wide law. The Federal agencies are not sufficiently equipped to cope single handed with the evil. The full powers of the State and its municipalities should be exerted to regulate the traffic and suppress abuse.

"III.

"Drug Selling and Peddling Should Be Made a Felony.

"The illegal sale and peddling of the designated drugs should be made a felony punishable by imprisonment for a long term. Trafficking in drugs is exceedingly profitable and the venal and desperate persons engaged in it will never be discouraged until they are made to realize that the risks are not worth the penalty. A few months in jail or a fine, will not deter them.

"IV.

"Hospital Treatment.

"The attitude of hospital management toward drug addiction should be modified. Neither public nor private hospitals care to take addicts; their suffering is intense and they are therefore troublesome. Since drug addiction is a disease, public hospitals should be compelled to receive them. The law should prescribe the process of commitment and the addict should be kept under custody as long as he remains in the institution. Philanthropic hospitals, in fulfillment of their humane purpose to relieve suffering, should equip wards or pavilions to which addicts can be legally committed, under State regulation and inspection. More hospital accommodations and competent physicians and nurses are needed to handle the number of addicts applying for treatment.

"V.

"Farm Colonies for Addicts.

"When the addict is incompetently treated and taken off the drug he is physically enervated and morally unfitted to withstand the disease and temptation to return to the drug. Some should be sent to a properly conducted farm colony where they can be physically built up and morally readjusted. The State of New York and the City of New York should each establish an institution of this kind.

"VI.

"After-Care.

"When the addict returns to the community from the institution, some form of after-care should be provided when necessary. The addict who goes back to old associations is almost certain to become readdicted if not completely treated and cured. In some cases, as in the treatment of inebriety and prostitution, contributing contacts must be broken if permanent results are to be secured.

"Many addicts interviewed said that return to old associations was responsible for readdiction; others said that after keeping away from the drug a long time 'discouragement', 'family trouble', 'lack of employment', 'depression', and 'sickness' were the causes of readdiction. If some friendly contact or association could be furnished when the need arises, many of them might be saved.

"VII.

"Coordination of State Institutions.

"More cooperation should be sought with State institutions for the treatment of drug addiction. If an addict is feeble-minded (and many of them are) he can be committed to such institutions. If a delinquent addict is mentally defective, there is room in Napanoch. Many addicts can be held in custodial institutions and receive treatment until they are fit to return to society.

"VIII.

"The Criminal Addict.

"Addicts charged with crime and detained before trial and addicts convicted of crime present two distinct considerations. The detained addict is confined in a jail which often contains no hospital and gives little or no treatment. The withdrawal sufferings take place during this period. Either decent hospital accommodations and adequate treatment should be provided in the jails, which is not likely to happen, or the addicts needing treatment should be removed to a public hospital under custody previous to their final disposition.

"After sentence is imposed the addict should receive more humane and scientific treatment in the penal and correctional institutions. Doctors in these institutions should adopt scientific methods and give to the drug addict the same specialized attention they give to other diseases. More individual and differentiated treatment is also needed in institutions using the gradual reduction method.

"IX.

"The Non-criminal Addict.

"Because penal and correctional institutions exercise custody, the easy way for the public to dispose of addicts seeking treatment is to call them criminals and shove them out of sight into prisons or so-called correctional institutions. They are pronounced guilty of a 'vicious-habit,' or 'pernicious vice.' The criminal records of many of them consist of previous convictions of the use of drugs or previous self commitments for treatment and many have no previous convictions or commitments of any kind. Such procedure is not just; no person suffering from a disease should primarily be sent to prison for its treatment.

"Non-criminal addicts should not be committed to the prison on Riker's Island or to the Workhouse on Welfare Island or to Bedford Reformatory. Physical conditions are unfit on Riker's Island and the association and contacts on Riker's Island, in the Workhouse and in Bedford Reformatory are depraved and criminal. The great City of New York should not continue to misuse these unfortunates who are willing, voluntarily, to undergo great suffering in the hope that they can be cured of disease. The proposal to extend this method of treatment to non-criminal addicts throughout the State is repugnant and harks back to the time when paupers were sent to workhouses and the insane to poorhouses.

"X.

"Research.

"A good deal of study and research is necessary to understand drug addiction, especially in gathering statistical information and in medical diagnosis and treatment. Research work should be encouraged.

"Recommendations.

"1. That children in the schools be instructed in the facts and evils of drug addiction and warned against the causes producing the disease.

"2. That a rational State law be enacted for the intelligent regulation of the use, possession, traffic in and sale of habit-forming drugs.

"3. That the illegal sale and peddling of the proscribed drugs be made a felony with severe penalties.

"4. That public hospitals be required to receive under custody persons suffering from the disease of drug addiction and their medical and nursing staffs be trained in its proper treatment and cure.

"5. That the State of New York and the City of New York, each establish a farm colony for the treatment of drug addiction and secure intelligent and competent administration.

"6. That drug addicts eligible for admission be committed to State custodial institutions.

"7. That more humane treatment be accorded to drug addicts in public institutions; that proper scientific methods be adopted; and that more specialized attention be given to inmates suffering from the disease.

"8. That persons who are not convicted of crimes be not committed to prison and correctional institutions for treatment of the disease of drug addiction.

Respectfully submitted,
(Signed) Frank E. Wade,
Chairman.
Cecilia D. Patten,
Walter W. Nicholson,
Leon C. Weinstock,
Commissioners."

Ministry of Health of Great Britain
Departmental Committee on Morphine and Heroin Addiction—1926.[31]

The report of the Committee [32] deals with a question not frequently considered in this country: namely, the continued supplying of an opium preparation in certain cases in which an intercurrent malady does not exist. The report states:

"Apart from the cases dealt with in the two preceding paragraphs, we are satisfied that any recommendations for dealing with the problem of addiction at the present time must take account of and make provision for the continued existence of two classes of persons, to whom the indefinitely prolonged administration of morphine or heroin may be necessary:

"(a) Those in whom a complete withdrawal of morphine or heroin produces serious symptoms which cannot be treated satisfactorily under the ordinary conditions of private practice; and

"(b) Those who are capable of leading a fairly normal and useful life so long as they take a certain quantity, usually small, of their drug of addiction, but not otherwise.

"Most of the witnesses admitted the existence of these two classes of cases, though in some instances with reluctance. Some physicians of great experience believed that if thorough treatment could be carried out in all cases, it would very rarely, if ever, be found necessary to provide any addict with even a minimum ration of drug for an indefinite period. It was recognised, however, even by these witnesses, that under present conditions it was not possible, for reasons already stated (see paragraph 44), thoroughly to treat all cases. There must, consequently, remain persons in whom a complete cure cannot be expected.

"Further, many of the witnesses were of the opinion that, even were it possible to treat thoroughly all cases, there would still exist a certain number of persons who could be grouped in one or other of the two classes above enumerated. When, therefore, every effort possible in the circumstances has been made, and made unsuccessfully, to bring the patient to a condition in which he is independent of the drug, it may, in the opinion of the majority of the witnesses examined, become justifiable in certain cases to order regularly the minimum dose which has been found necessary, either in order to avoid serious withdrawal symptoms, or to keep the patient in a condition in which he can lead a useful life. It should not, however, be too lightly assumed in any case, however unpromising it may appear to be at first sight, that an irreducible minimum of the drug has been reached which cannot be withdrawn and which, therefore, must be continued indefinitely. Though the first attempt entirely to free a patient from his drug may be a failure, a subsequent one may be successful. In this connection a paragraph may be usefully quoted from the *précis* of evidence furnished to us by one of the general practitioner witnesses who has successfully treated several cases of addiction: 'I have encountered cases where for a time administration had to be continued on account of physical and mental distress when withdrawal was attempted. In every case, as soon as possible, further attempts to get the patient to give up the habit were made. In two cases, for a period of several months, it was necessary to continue administration of small doses of morphia to allow the patient to lead a useful life. In both cases it was finally given up.' "

---

[31] Ministry of Health. Departmental Committee on Morphine and Heroin Addiction. Report. His Majesty's Stationery Office. London, 1926.

[32] For the membership of this Committee see page 131, footnote.

The same report considers at some length what may be accomplished toward the prevention of medically formed cases of opium addiction where possibly the drug has been used ill-advisedly or for unnecessarily long periods. The discussion of this phase of the problem follows:

"Precautions in the Use of the Drugs in Ordinary Medical Practice.

"The evidence we have heard would appear to indicate that there has been a recent diminution in the prevalence of morphine addiction, and that this is due to the operation of the Dangerous Drugs Acts in making it difficult to obtain the drugs except from or on the prescriptions of doctors. (See para. 24.) This enhances the importance of consideration of the precautions that are necessary in the use of these drugs in ordinary treatment, in order to reduce to a minimum the risk that a patient may develop a craving for them. These precautions are, we think, fairly well recognised among competent and careful practitioners in all branches of the profession, and the conclusions here stated, based on the testimony of our medical witnesses, including representative general practitioners, may, we believe, be regarded as expressing fairly the opinion of all members of the profession who have given the requisite attention to the subject.

"Where the patient is suffering from organic disease for the treatment of which the drugs are necessary, the matter may be considered under two aspects, (a) cases in which the administration of morphine or heroin may be necessary for an indefinite period and in which the probability of a cure of the disease is remote (e.g., inoperable cancer and the like), (b) cases in which administration of the drugs is called for in order to deal with conditions which, though due to organic disease, may be expected to be of a more or less temporary duration (such as renal or biliary colic, etc.). In regard to class (a), since consideration of the possibility of the establishment of a craving cannot be allowed to influence the administration of such doses of the drugs as are considered necessary for the adequate treatment of the organic disease, it will be in those rare cases only in which there is some prospect of partial or complete recovery from the disease that any attention can properly be given, during the course of treatment, to such measures as are likely to mitigate or avert the risk of subsequent persistence of any craving which may have been produced. In respect to class (b), the employment of these measures becomes of paramount importance. They are identical with those discussed in paras. 59 and 60, and consist mainly in the substitution, when possible, of other drugs for morphine and heroin, in close supervision by the practitioner of the amounts used and of the frequency with which they are administered, and in withdrawal of the drug as soon as the necessity for its administration has ceased.

"In stating the precautions which we think should be observed in cases other than those referred to in the preceding paragraph, we shall be understood to have in mind, particularly, those cases in which it is thought necessary to administer, say, morphine, in such doses, with such frequency and for so long a period as may be requisite, for example, for the relief of pain after surgical operations, or in cases of severe neuralgia in which the necessary relief cannot be obtained otherwise.

"In cases in which it appears that the use of morphine or heroin may be thus desirable, it must first be considered whether the purpose of treatment can be substantially as well served by other drugs that do not involve the risk of addiction. Constant attention is necessary to adjust the dosage to the varying needs of the case. The intervals at which it is desirable to see a patient (not an addict) who requires the administration of morphine or heroin will necessarily be determined by the nature of the case. In cases of chronic disease requiring a more or less prolonged administration of the drugs, the patient need only be seen at such intervals as are appropriate on other medical grounds, but in cases such as renal or biliary colic, in which the necessity for the administration may cease at any moment, it may be important to see the patient more often than would otherwise be necessary in order to guard against the production of a craving.

"The quantity supplied or ordered at one time for use by those nursing the patient should not ordinarily exceed what will be required before the patient is seen again. Where any discretion is given to nurses as to administration it should be strictly limited by prescription, and any change made in the treatment should similarly be stated in writing. The practitioner will realise that the responsibility for administration is entirely his, and cannot properly be delegated to any person not medically qualified. It is desirable also that the patient should not be informed of the name of the sedative drug employed; particularly inexpedient is the handing over to the patient of original packages containing morphine tablets, or the like, which bear on their labels a clear statement of the exact amount in each tablet. Hypodermic administration of the drug by the patient to himself is to be strongly deprecated.

"The use of the drug should be discontinued as soon as possible, and, if unfortunately a craving has formed, close supervision and appropriate treatment must be maintained until the medical attendant is satisfied that the patient has been rendered independent of the drug. It is to be noted in this connection, that, in the opinion of some authorities, a month's continuous administration of morphine may suffice to produce in a person who previously appeared normal a condition of addiction (as shown by withdrawal symptoms observed on discontinuance); and in persons with an inherent predisposition, administration for a shorter period may have this effect.

"Most of our medical witnesses have concurred as to the desirability of special instruction to medical students on the precautions necessary in the use of morphine and certain other drugs in order to avoid the development of addiction. One or two medical witnesses, on the other hand, expressed doubt whether such instruction might not accentuate the undue timidity which they believed was not uncommon among practitioners, with the untoward consequences above described (see para. 32). We think, however, that such a result need not be feared from a full exposition of the actions, both valuable and harmful, of these drugs, the indications for their use, their proper place in treatment, the dangers to be guarded against, and the best means of averting these dangers. We think also that medical practitioners already in practice should welcome the issue of a Memorandum affording guidance on this important and difficult subject."

E. Joël and F. Fränkel—1927.[33]

As fundamental to the adoption of rational public measures against the misuse of narcotics, the authors report their findings from both their clinic and private practices, covering about 600 cases of drug addiction treated in Germany. Among the preparations cited as used by their cases are the following: morphin, tincture of opium, pantopon, dicodid, dilaudid, eukodal, heroin, paramorphin, trivalin, eumecon, and cocain. They state that about half of their cases obtained the drug illegally in spite of the Opium Statute covering the distribution of dangerous drugs. It requires that such preparations be supplied to the public only as remedies on the written prescription of the physician, dentist, or practitioner of veterinary medicine. The regulations of this statute, they state, are very commonly disregarded. Among the types of violation, they mention the refilling of prescriptions, the use of "standing prescriptions" (for which there is no provision in the law), the delivery of narcotics without prescriptions by pharmacists, the forging of prescriptions—made possible through collusion or carelessness on the part of the druggist, purchasing of prescriptions for from 20 to 50 pfennigs, the obtaining of prescriptions for the drugs by non-addicts who simulate addiction and dispose of the drug to habitual users, the "legal" but reprehensible writing of prescriptions for any quantities by a certain physician, the peddling of drugs stolen from public stores and manufacturers, "speak-easies" for addicts where the injection is given by the proprietor of so-called *"Pennerkneipen"* or night-shelters, etc.

---

[33] Joël, E., and F. Fränkel—Oeffentliche Massnahmen gegen den Missbrauch von Betaubungsmitteln. Klinische Wochenschrift. 1927. Vol. 6. No. 22.

As remedial measures they state that "the basis of the legal traffic in dangerous drugs is the prescription." They point out that it is the duty of the druggist in preparing and delivering dangerous drugs, to make sure that the prescription is not a forgery, a matter easily verified. They further point out the duty of the physician to be careful in the writing of such prescriptions, and recommend that they be written on printed blanks bearing the telephone number of the physician and his full address, and include directions for use. They recommend further that in the prescribing of dangerous drugs the doctor should be restricted to the drugstores of the district in which he resides, thus making it easier for the druggist to verify the authenticity of a prescription. As a still better provision, they recommend the use of the official prescription blank, such as is used in the United States, under the provisions of the Harrison Act.

Cocain and certain other drugs, they state, should never be delivered in pure forms but only in solutions which would be far more difficult to peddle than is the powder. In this connection they state that eukodal in a pure form is no longer placed on the market by the firm which manufactures it, even though it does not come under the Opium Statute. While it is not a derivative of morphin, biologically it is an opiate and should, they think, be included in the international opium agreement and in the German Opium Statute. In this connection they state:

> ". . . The abuse of eukodal is not inconsiderable; it is a favorite with former cocain addicts in particular, and is obtainable illicitly. It is prized because it contains a stimulating component in addition to its narcotic effect. Many addicts declare that morphin together with a little cocain is about equivalent in effect to eukodal. It is a very frequent occurrence for former morphinists to go over to eukodal. The patients themselves explain that the druggist can give it to them without prescription, since he does not require a 'drug certificate' for eukodal."

They denounce the continued prescribing of cocain, even in decreasing doses, to habitual users, as it is so prescribed only for the "pleasure" it gives, and quote a decision of the Supreme Court in this connection, in which the delivery of cocain prescriptions can incur the guilt, on the part of the physician, of abetting illicit acquisition of cocain. From the legal point of view it has been said, they state, that what the Supreme Court decision says with reference to cocain, is equally applicable to morphin and similar narcotics. They continue, however, as follows:

> "Theoretically, this might happen. The state of affairs with reference to morphin is, however, quite different. The morphinist, as soon as he has really succumbed to his craving, no longer derives, as must be repeatedly emphasized, any real *pleasure* from his syringe; he only gets the re-establishment of his equilibrium. The morphinist, when in want of his drug, is actually like a patient with objective symptoms. This acute form of morphinism is relieved at a stroke by an appropriate dose of morphin, and is so relieved as can be done *only* through morphin (or a related opiate). The morphinist feels well again, but there can be as little talk of enjoyment in this connection as there might be with regard to the coming out of a faint or the recovery after a fit of weakness. In a pronounced case of morphinism, is morphin a remedy or a means of enjoyment? It cures the acute morphin debility, the abstinence symptoms; it does not cure morphinism, of course; it merely fosters it. On no account, however, is it a means of enjoyment. There could be talk of the latter only when, there being no need to relieve pain or to satisfy the cravings of morphinism, morphin is prescribed for *incidental* enjoyment, for sensual gratification, and the like. But this happens very rarely in the case of morphin.
>
> "Every physician who comes to know a morphinist (without other ailment) will try to induce him to submit to a withdrawal cure; but economic or professional reasons, for example, may make immediate action upon such advice impossible. In such cases (the same is true, to a slighter extent, for cocain) the physician will have to be satisfied with reducing the doses as much as possible. There are also cases in which comparatively small doses will keep the individual fit for work; a cure, however, brings no improvement but rather causes trouble in other directions; varied experience then causes the individual to refuse withdrawal treatment. In such cases, too, the prescription of morphin will have to be regarded as a curative measure. Above all, there can be no talk of enjoyment in those cases—rare to be sure—in which the drug compensates for a constitutional debility, a defect of vitality. Only the doctor, after a most careful examination, can render a decision as to the presence of such a condition."

As a further control measure they recommend "bureaus" for the care of addicts, stating:

> "This is the point at which the community health bureau can step in with

the work of bureaus for addicts, to which—at least in large cities—bureaus for alcohol-patients should be added. The physician who supposes that he is only one of many who write prescriptions for the addict, the druggist who is continually importuned for narcotics, will turn such a patient over to the physician of the bureau for a clearing up of the situation. This method has proved itself practical. Frequently it will then be possible to put through the withdrawal cure, long since contemplated but continually put off—or at the least, the patient can be turned over from there into *one* hand. It is the practitioners themselves who have from time to time proposed the duty of reporting addicts (partly, I suppose, for the sake of ridding themselves of the uncomfortable feeling induced by the constant issuing of prescriptions for intoxicating drugs). This proposal might seem at first too drastic, but a certain localizing, which would restrict the journeyings of patients from physician to physician and from drug store to drug store, would be desirable.

"Moreover, in cases where the addiction has led to neglect of the family, the bureau is better able than the individual physician to exert a certain pressure, occasionally even to have the patient declared irresponsible, at least until a final withdrawal cure has been accomplished."

In connection with the putting out by manufacturers of new preparations possessing narcotic properties as safe substitutes for opium derivatives, the authors state:

"The manner in which producers make known new narcotic remedies to physicians also seems to us in need of reform. The practitioner generally thinks that among opiates, for example, he is getting a real substitute for morphin, when in reality he is being offered only a stronger or weaker morphin. This is especially important when addiction is in question. A certain amount of time is required before a remedy develops a craving, before the craving begins to need treatment, before the individual physician can observe sufficient cases, in order to be able to speak with some degree of certainty as to the question of addiction. By the time the situation has reached that point the new remedy has already firmly established itself, and it is discovered too late that it offered not the least advance so far as addiction formation was concerned.

"This holds for eukodal as well as for dicodid and dilaudid. We find that the pharmaceutical prospectuses generally treat the question of addiction as concerns the particular new remedy which they are recommending, too optimistically. Too little consideration is given to the fact that in the very great majority of patients who take morphin the craving also fails to develop. It is hard to see why the danger of a craving should be smaller in the case of the new substitutes than it is with morphin. The facts speak to the contrary. It is likewise dangerous to say that eukodal is not a morphin combination or a morphin derivative. That is correct enough, but it is of no interest to the practitioner. He is concerned with the effect and not with the chemical composition. For him eukodal *is* a substance akin to morphin in its action, with all the secondary effects and dangers of morphin, and the same holds for dicodid and dilaudid, which likewise do not come under the Opium Statute.

"One must not object that these are questions which can be actually answered only after a fairly long administration of the remedies. Craving springs from the soil of euphoria, and then especially when continuous use has brought increased tolerance of the drug. The question as to whether a remedy induces euphoria can frequently be determined clinically even after a single administration. The question of increased tolerance, on the other hand, can be tested without difficulty in animal experiments; it is even possible, through comparison with morphin as control substance, to arrive at a definite quantitative comprehension of the effect of addiction (cf. the work of E. Joël and A. Ettinger).

"These precautions should in the future not be neglected when a new remedy is introduced, and one might wish that Boards of Health would demand such investigations, and that on occasion they would themselves carry them out and then require that the announcements of the pharmaceutical firms contain exact information. The authorities should also take into consideration, when the remedies are codified, not only the chemical formula but also the action. If, therefore, a substance, no matter how differently constituted from morphin, acts like morphin, it belongs under the Opium Statute (which, despite its name, holds for cocain as well). The Opium Statute loses its significance if it imposes no restrictions on remedies which, exactly like morphin and heroin, might lead to addiction.[34]

"An example which borders on conscious deception is the advertisement for eumecon, a remedy for the 'treatment of morphinism.' Eumecon is a 2% morphin solution with some non-essential additions. Up to a short time ago, the firm even kept silent as to the fact that eumecon is morphin. But even now it still indulges in all sorts of mystery mongery. Instead, as would be logical, of drawing a distinction between morphin as an injection and morphin as a drink, it draws the distinction between morphin as an injection and eumecon as a drink. 'Eumecon, taken as a drink, is subjected to the entire process of metabolism, which alters the eumecon adaptably to the whole and changes it into useful substances.' An abstruse statement without even an attempt at proof.

"As on a former occasion, so again here, we wish to emphasize the fact that a remedy like trivalin, which is very much misused, must disappear altogether. We cannot imagine any indication for which the prescription of a mixture of morphin, cocain, caffein, and valerian would have any meaning.

"Recently—after a lapse of 40 years—the therapeutic application of *Indian hemp* has again been much discussed. Since there is no therapeutic advance made in the meantime, at the basis of the discussion, it would appear as if medical practice were trying to adapt itself to the needs of the drug market. 'Hashish is peculiar for its agreeable after-effect,' says one prospectus, omitting all mention of the fact that it is an intoxicating drug of the first rank. Another says: 'Cannabis indica is a mild, innocuous hypnotic.' In a third, cannabis is even designated as 'an excellent therapeutic agent.' Quite apart from the fact that there is no evidence for that (cf. E. Joël), there is nowhere a word as to the dangers of the abuse of a remedy which, incidentally, has not as yet been included in the Opium Agreement, and still worse, is not even subject to the compulsion of prescription. If Casparis thinks that hashish, even if obtainable, could scarcely acquire significance as a narcotic in Europe, it might be pointed out that similar theories, originally held with reference to coca and cocain, later proved themselves an illusion fraught with heavy consequences.

---

[34] The international opium agreement, Art. 14, offers a means of getting at this.

CONCLUSIONS

"On the basis of the facts herein reported, we arrive at the following requirements:

"Dangerous narcotics should be prescribed on printed prescription blanks only, which should bear the full address of the physician (with telephone number) and the address of the patient. The prescription should contain directions for using.

"The introduction of a prescription pad for narcotics, to be issued officially, might be given consideration as a more far-reaching provision.

"Prohibition of the delivery of narcotics in pure form to patients.

"Inclusion of eucodal, dilaudid, and dicodid under the Opium Statute. Alteration of the statute to the effect that all addiction-forming narcotics should come under it.

"Establishment of bureaus for the care of addicts.

"Participation of insurance companies in provisions for preventing and curing.

"Restriction of deceptive advertisements. Prohibition of trivalin.

"In conclusion, utmost emphasis should be placed on the fact that despite all the necessary and improvable public provisions against alkaloid addictions, the central question will always be a *medical* one and not a *legal* one. In more senses than one, the physician is responsible for the origin and treatment of addictions. He must permit his patients as little and as brief acquaintance with narcotics as is compatible with therapeutic purposes. In the cases in which intoxicating drugs are adopted as a necessity of life, he must attempt to introduce in their place something really helpful and not merely palliative, and that is a much harder task than the mere withdrawal cure, which, without some provision of that sort, generally proves useless. Of this responsibility he must ever be conscious; not even the best legislation can relieve him of that."

Résumé

A review of the past and current control measures directed at the problem of chronic opium intoxication shows that, although a thorough understanding of the fundamentals of this problem is needed for its solution, an appreciation of the importance of this need all too often has been lost sight of in drafting and putting into effect such measures.

The data submitted include statements of fact and expressions of opinion supposedly based upon experience and made by individuals whose integrity and intelligence should not be doubted, and yet, with scarcely a single exception, both the facts recorded and the opinions expressed categorically have been denied by others whose honesty and judgment equally should be respected. Many of these facts and opinions are perhaps relatively insignificant, but some of them are fundamental. As an example—an instance of the utmost importance—may be taken the difference in views regarding the general nature of chronic opium intoxication. Here have been recorded explanations varying from the vicious, deliberate habit theory to the extreme of the theories held by the strictly physical school and all grades and combinations in between. This is fundamentally a matter for accurate determination, as at least one essential preliminary to any plan for complete solution. Yet there is not a single variety of view which from the evidence adduced is so well supported or so thoroughly demonstrated to be correct as not to admit of doubts in the minds of any who might attempt to base thereon a program purporting rationally to solve the problem. In other words, certain of the fundamentals for the solution of the problems comprised in chronic opium intoxication are either not known or not sufficiently well-established to permit an unbiassed advocacy of any single method of procedure.

It is certainly not beyond the realm of possibility to conceive that in each one of the views expressed there is an element of truth. In fact, in consideration of the experience, training, and apparent honesty and intelligence of those advocating them, it is more than probable that such is actually the case, and yet at this time the differences of opinion are so great as to make it impossible to devise from them any general scheme of action which may be expected to escape just criticism, if not actual failure.

Current knowledge and common observation are sufficient to convince anyone of the very serious shortcomings of every program which has so far been put into general operation and every such plan has been based largely on one or another of the as yet unproved theories or opinions covered in the data submitted.

The conclusions are:

First, no single one of the widely divergent explanations of the exact nature or mechanism of chronic opium intoxication is sufficiently well supported to permit of its unqualified acceptance.

Second, granting that the above is true, any procedure based upon one or another or any combination of these views may lead to manifest errors of handling and even to widespread injustice and to failure of accomplishment.

Third, if these two deductions are correct, the basis of a sound method of control through legislative and administrative procedures is lacking, namely, accurate knowledge of the very nature of the condition with which such legislation and administration deal.

Confronted with such a situation, two courses of action are open to anyone interested in the solution of the problem. The first of these is to continue the search for further information through approved methods of investigation, to corroborate or disprove any one or all of the different theories, or to substitute a new one. Second, pending the determination of knowledge sufficient to permit of the formulation of sound measures for alleviation and control, to view with grave concern the advocacy of any policy which takes into consideration and assumes as its basis exclusively any one of the existing explanations of the nature of this condition. In other words, at no time in the past and as far as we know in no present plans for the future have the obvious essentials to a successful issue been taken into consideration. But in place of this, definite and specific laws and regulations have been adopted and inelastic interpretation and administration have been practiced on the basis of assumptions that may be either true or false.

In view of the extreme complexity of the problem as a whole and of what would appear at this time to be the fairest assumption of all in regard to the expressed opinions, namely, that each one may contain a partial truth, it would be well to advocate the most elastic administrative measures possible. Such an adjustable policy should be adopted towards the individuals involved in this condition and towards the medical profession or others whose legitimate business or profession brings them into contact with them, as will reveal—and so create a more widespread understanding of—the essential differences in the individual types and in their physiologic and psychic reactions under the influence of the chronic use of opium.

The same tolerance and elasticity of administration should be applied to whatever systems tentatively are employed in the handling of these patients, especially when such systems have proved efficient in the handling of other medico-social problems or where in default of exact knowledge more hopeful measures are not available. As we have pointed out elsewhere it seems that needless difficulties have been placed in the way of the clinical, psychiatric and sociologic handling of certain types of chronic opium users. Thus certain clinics that were instituted for these purposes seem from the reports received from many quarters to have offered unusual opportunities for much needed studies along many lines. They represented a constructive experiment and offered promise of material benefits. They were closed arbitrarily, however, regardless of individual merits while still in a period of increasing usefulness and before their development had progressed sufficiently to permit of final evaluation.

Above all it is important to encourage those who by training and experience seem best qualified to carry on research or to apply existing knowledge in this developmental stage of ideal or ultimate solution.

Even the most cursory review of the development through many centuries of the opium problem; of its penetration into every country of the world; of its proper and improper relationships to individual and group life; of the fundamental human needs involved as well as the fundamental human vices; of the irreplaceable nature of the drug itself and its apparently unique biologic effects, to say nothing of the direct, indirect and frequently very complex etiologic factors involved in its chronic use, should serve to impress the thoughtful with the urgent need of more accurate knowledge, of more careful consideration of *all* of the available facts, and of more caution in the expression of opinions and in the advocacy of policies that tomorrow may be shown to have been ill-judged if not maleficent.

It is our opinion that while international accord and cooperation is desirable as a step towards final solution, the most important outgrowth of the various international deliberations will be, not the actual control of production with its resulting curtailment of the illicit traffic, but rather the achievement of having focussed international attention on a problem that from its very nature affects actually or potentially all peoples both beneficially and harmfully, and that appears to have increased rather than diminished with scientific and sociologic advancement. This directing of attention and interest we believe will result in stimulating orderly thought and study of a subject that for a long period has commanded too little earnest consideration, while many from interested motives alone have contributed to its confusion. With the development of an increasingly extended intellectual approach and a corresponding decrease of emotional, commercial and other interests it is reasonable to expect the growth of sound and well-founded policies of an international, national and above all medical and sociologic character that ultimately will reduce the evils of opium use to the minimum consistent with its proper therapeutic employment. Until such time we should look with disfavor upon dogmatic statements and arbitrary and unscientific rulings relating to either groups or individuals, while seeking in the experiences of all earnest and intelligent workers such elements of fact as may be uncovered and utilizing them in the gradually evolving plans for prevention and control that unquestionably will develop with an increased knowledge and eventually supersede the chaos of contradictory opinion that marks present-day activities.

APPENDIX I

International Opium Convention Signed at The Hague, January 23, 1912

His Majesty the German Emperor, King of Prussia in the name of the German Empire; the President of the United States of America; His Majesty the Emperor of China; the President of the French Republic; His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India; His Majesty the King of Italy; His Majesty the Emperor of Japan; Her Majesty the Queen of the Netherlands; His Imperial Majesty the Shah of Persia; the President of the Portuguese Republic; His Majesty the Emperor of All the Russias; His Majesty the King of Siam

being desirous to take one step further in the way marked out by the International Commission at Shanghai in 1909;

resolved to pursue progressive suppression of the abuse of opium, morphine, cocaine as well as drugs prepared or derived from these substances giving rise or which may give rise to analogous abuses;

taking into consideration the necessity and the mutual profit of an international understanding on this point;

being convinced that they will meet in this humanitarian effort the unanimous adhesion of all the nations interested,

have resolved to conclude a Convention for this purpose and have appointed as their Plenipotentiaries, to wit:

His Majesty the German Emperor, King of Prussia:

His Excellency Mr. Felix de Muller, His present Privy Counsellor, His Envoy Extraordinary and Minister Plenipotentiary at The Hague;
Mr. Delbruck, His Superior Privy Counsellor;
Dr. Grunenwald, His Counsellor of Legation;
Dr. Kerp, His Privy Counsellor, Director at The Imperial Health Office;
Dr. Rossler, Imperial Consul at Canton.

President of the United States of America:

Bishop Charles H. Brent;
Dr. Hamilton Wright;
Mr. H. J. Finger.

His Majesty the Emperor of China:

His Excellency Mr. Liang Cheng, His Envoy Extraordinary and Minister Plenipotentiary at Berlin;

The President of the French Republic:

Mr. Henry Brenier, Inspector of the Agricultural and Commercial Services of Indo-China;

Mr. Pierre Guesde, Administrator of the Civil Services of Indo-China.

His Majesty the King of the United Kingdom of Great Britain and Ireland and the British Dominions Beyond the Seas, Emperor of India:

The Right Honorable Sir Cecil Clementi Smith, G. C. M. G., Member of the Privy Council;

Sir William Stevenson Meyer, K. C. I. E., Chief Secretary of the Government of Madras;

Mr. William Grenfell Max-Muller, C. B., M. V. O., His Counsellor of Embassy;

Sir William Job Collins, M. D., Deputy Lieutenant of the County of London.

His Majesty the King of Italy:

His Excellency Count J. Sallier de la Tour, Duke of Calvello, His Ambassador Extraordinary and Minister Plenipotentiary at The Hague.

His Majesty the Emperor of Japan:

His Excellency Mr. Aimaro Sato, His Envoy Extraordinary and Minister Plenipotentiary at The Hague;

Dr. Tomoe Takagi, Engineer of the General Government of Formosa;

Dr. Kotaro Nishizaki, Technical Specialist attached to the Laboratory of Hygienic Service.

Her Majesty the Queen of the Netherlands:

Mr. J. T. Cremer, Her Former Minister of the Colonies, President of the Dutch Commercial Company;

Mr. C. Th. van Deventer, Member of the First Chamber of the States General;

Mr. A. A. de Jongh, Former Inspector General and Chief of the Opium Regie Service in the Dutch Indies;

Mr. J. G. Scheurer, Member of the Second Chamber of the States General;

Mr. W. G. van Wettum, Inspector of the Opium Regie in the Dutch Indies.

His Imperial Majesty the Shah of Persia:

Mirza Mahmoud Khan, Secretary of the Persian Legation at The Hague.

The President of the Portuguese Republic:

His Excellency Mr. Alexandre Savinsky, His Master of Ceremonies, His present Counsellor of State, His Envoy Extraordinary and Minister Plenipotentiary at Stockholm.

His Majesty the King of Siam:

His Excellency Phya Akharaj Varadhara, His Envoy Extraordinary and Minister Plenipotentiary at London, The Hague and Brussels;

Mr. Wm. J. Archer, C. M. G., His Counsellor of Legation.

Who after having deposited their full powers which have been found to be in good and due form are agreed to that which follows:

CHAPTER I

Raw opium

Definition. By raw opium shall be understood:

The spontaneously coagulated sap obtained from capsules of the soporific poppy (Papaver somniferum), and which shall not have been subjected to any but the processes necessary to the packing and the transportation thereof.

Article 1

The Contracting Powers shall enact efficacious laws or regulations for the control of the production and distribution of raw opium, unless existing laws or regulations have already regulated the matter.

Article 2

The Contracting Powers, taking into account the differences in their trade conditions, shall limit the number of towns, ports or other places through which the importation or exportation of raw opium shall be permitted.

Article 3

The Contracting Powers shall take measures:

a. to prevent the exportation of raw opium to countries which shall have prohibited the entry thereof, and

b. to control the exportation of raw opium to countries which shall have limited the importation thereof,

Unless existing measures have already regulated the matter.

Article 4

The Contracting Powers shall issue regulations to provide that every package containing raw opium destined for exportation shall be marked in such a manner as to indicate its contents, providing the consignment shall exceed 5 kilograms.

Article 5

The Contracting Powers shall not permit the importation and exportation of raw opium except through duly authorized persons.

CHAPTER II

Prepared opium

Definition. By prepared opium shall be understood:

The product of raw opium obtained by a series of special processes, particularly by dissolution, boiling, heating and fermentation, and which is meant to be made into the form of an extract suitable for consumption.

Prepared opium comprises dross and all other residues of smoked opium.

Article 6

The Contracting Powers shall take measures for the gradual and efficacious suppression of the manufacture, the internal traffic in and the use of prepared opium in so far as the different conditions peculiar to each nation shall allow of this, unless existing measures have already regulated the matter.

Article 7

The Contracting Powers shall prohibit the importation and exportation of prepared opium; however, those nations which are not yet ready to prohibit the exportation of prepared opium at once, shall prohibit such exportation as soon as possible.

Article 8

The Contracting Powers which are not yet prepared to prohibit at once the exportation of prepared opium:

a. shall limit the number of towns, ports or other places through which it shall be possible for prepared opium to be exported;

b. shall prohibit the exportation of prepared opium to the countries which now prohibit, or which shall later prohibit the importation thereof;

c. shall prohibit, in the meanwhile, that any prepared opium be sent to a country which desires to limit the entry thereof, unless the exporter shall conform to the regulations of the importing country;

d. shall take measures to the effect that each package exported containing prepared opium shall bear a special mark indicating the nature of its contents;

e. shall not permit the exportation of prepared opium except through the agency of persons especially authorized.

CHAPTER III

Medicinal opium, morphine, cocaine, etc.

Definitions. By medicinal opium shall be understood:

raw opium which shall have been heated to 60 degrees centigrade whether or not powdered or granulated, or whether or not mixed with neutral substances, and which shall not contain less than 10% of morphine.

By morphine shall be understood:

the principal alkaloid of opium, expressed by the chemical formula $C_{17}H_{19}NO$.

By cocaine shall be understood:

the principal alkaloid of the leaves of Erythroxylon Coca, expressed by the formula $C_{17}H_{21}NO_4$.

By heroin shall be understood:

morphine-diacetylate, expressed by the formula $C_{21}H_{23}NO_5$.

Article 9

The Contracting Powers shall enact pharmacy laws and regulations in such a way as to limit the manufacture, the sale and the use of morphine, cocaine and their respective salts to medical and legitimate uses only, unless existing laws or regulations have already regulated the matter. They shall cooperate amongst themselves in order to prevent the use of these drugs for any other purpose.

Article 10

The Contracting Powers shall use their best efforts to control, or to cause to be controlled all those who manufacture, import, sell, distribute and export morphine, cocaine and their respective salts, as well as the buildings where such persons exercise that industry or that commerce.

To this end, the Contracting Powers shall use their best efforts to adopt or to cause to be adopted the following measures, unless existing measures have already regulated the matter:

a. to limit the manufacture of morphine, cocaine and their respective salts to the premises and localities alone which shall have been authorized to this effect or to keep themselves informed as to the establishments and places where such drugs are manufactured, and to keep a register thereof;

b. to demand that all those who manufacture, import, sell, distribute, and export morphine, cocaine, and their respective salts shall be provided with an authorization of a license to carry on these operations, or shall make an official declaration thereof to the competent authorities.

c. to demand of these persons that they register on their books the quantities manufactured, the importations, the sales or any other transfer and exportations of morphine, cocaine and their respective salts. This rule shall not apply necessarily to medical prescriptions and to sales made by duly authorized pharmacists.

Article 11

The Contracting Powers shall take measures to prohibit in their internal commerce all transfer of morphine, cocaine and their respective salts to all non-authorized persons, unless existing measures have already regulated the matter.

Article 12

The Contracting Powers, taking the differences in their conditions into account, shall use their best efforts to limit the importation of morphine, cocaine and their respective salts, to authorized persons.

Article 13

The Contracting Powers shall use their best efforts to adopt, or cause to be adopted, measures to the end that the exportation of morphine, cocaine and their respective salts from their countries, possessions, colonies and leased territories to the countries, possessions, colonies and leased territories of the other contracting powers, shall not take place except in case the persons for whom the drugs are intended shall have received authorizations or permits granted in conformity with the laws or regulations of the importing country.

To this end every government may from time to time communicate to the governments of the exporting countries lists of the persons to whom authorizations or permits to import morphine, cocaine and their respective salts shall have been granted.

Article 14

The Contracting Powers shall apply the laws and regulations for the manufacture, importation, sale or exportation of morphine, cocaine and their respective salts:

a. to medicinal opium;

b. to all preparations (official and non-official including the so called anti-opium remedies) containing more than 0.2% of morphine or more than 0.1% of cocaine;

c. to heroin, its salts and preparations containing more than 0.1% of heroin;
d. to every new derivative of morphine, cocaine or their respective salts or to any other alkaloid of opium which might after generally recognized scientific investigations give rise to similar abuse and to result in the same injurious effects.

CHAPTER IV

Article 15

The Contracting Powers having treaties with China (Treaty Powers) shall take, on concert with the Chinese Government, the measures necessary for the prevention of the smuggling, as well with respect to Chinese territory as with respect to their colonies in the Far East and the leased territories which they occupy in China, of raw and prepared opium, morphine, cocaine and their respective salts, as well as of the substances indicated in article 14 of the present Convention. On its side the Chinese Government shall take analogous measures for the suppression of the smuggling of opium and the other substances hereinbefore indicated, from China to foreign colonies and leased territories.

Article 16

The Chinese Government shall promulgate pharmacy laws for its subjects, regulating the sale and distribution of morphine, cocaine and their respective salts and of the substances indicated in article 14 of the present Convention, and shall communicate these laws to the Governments having treaties with China, through the intermediary of their diplomatic representatives at Pekin. The Contracting Powers having treaties with China shall examine these laws, and, if they find them acceptable, shall take the necessary measures to the end that they be applied to their nationals residing in China.

Article 17

The Contracting Powers having treaties with China shall undertake to adopt the measures necessary for the restraint and control of the opium-smoking habit in their leased territories, "settlements" and concessions in China, for the suppression *pari passu* with the Chinese Government of the opium divans or similar establishments which may still exist there, and for the prohibition of the use of opium in houses of amusement and of prostitution.

Article 18

The Contracting Powers having treaties with China shall take effective measures for the gradual reduction, *pari passu* with the effective measures which the Chinese Government shall take to the same end, of the number of shops, intended for the sale of raw and prepared opium, which may still exist in their leased territories, settlements and concessions in China. They shall adopt efficacious measures for the restraint and control of the retail trade in opium in the leased territories, settlements and concessions, unless existing measures have already regulated the matter.

Article 19

The Contracting Powers who have post-offices in China shall adopt efficacious measures to prohibit the illegal importation into China, in the guise of a postal package, as well as the illegal transmission from one locality to another in China through the intermediary of these post-offices, of opium, whether raw or prepared, of morphine and of cocaine and their respective salts, and of other substances indicated in article 14 of the present Convention.

CHAPTER V

Article 20

The Contracting Powers shall examine into the possibility of enacting laws or regulations making the illegal possession of raw opium, prepared opium, morphine, cocaine and their respective salts liable to penalties, unless existing laws or regulations have already regulated the matter.

Article 21

The Contracting Powers shall communicate to each other, through the Netherlands Ministry for Foreign Affairs:

a. the text of the laws and the administrative regulations in existence which concern matters aimed at by the present convention or enacted by virtue of its clauses;

b. statistical information with respect to that which concerns the traffic in raw opium, prepared opium, morphine, cocaine and their respective salts, as well as all other drugs or their salts or preparations aimed at by the present Convention.

These data shall be furnished with as much detail and in as short a time as shall be deemed possible.

CHAPTER VI

Final Provisions

Article 22

The Powers not represented at the Conference shall be permitted to sign the present Convention.

To this end, the Netherlands Government shall invite, immediately after the Convention shall have been signed by the Plenipotentiaries of the Powers who have taken part in the Conference, all the Powers of Europe and of America not represented at the Conference, to wit, the Argentine Republic; Austria Hungary; Belgium; Bolivia; Brazil; Bulgaria; Chile; Colombia; Costa Rica; Republic of Cuba; Denmark; Dominican Republic; Republic of Ecuador; Spain; Greece; Guatemala; Republic of Haiti; Honduras; Luxemburg; Mexico; Montenegro; Nicaragua; Norway; Panama; Paraguay; Peru; Roumania; Salvador; Servia; Sweden; Switzerland; Turkey; Uruguay; United States of Venezuela, to designate a Delegate armed with the full powers necessary for the signing of the Convention at The Hague.

The Convention shall be furnished with these signatures by means of a "Protocol of signature of Powers not represented at the Conference," to be added after the signatures of the Powers represented and indicating the date of each signature.

Article 23

After all the Powers, as much for themselves as for their possessions, colonies, protectorates and leased territories, shall have signed the Convention, or the supplementary Protocol hereinbefore indicated, the Netherlands Government shall invite the Powers to ratify the Convention together with this Protocol.

In case the signature of all the Powers invited shall not have been secured by December 31, 1912, the Netherlands Government shall immediately invite all the powers who have signed by that date, to designate Delegates to proceed to The Hague to examine into the possibility of nevertheless depositing their ratifications.

Ratification shall be executed within as short a time as possible and shall be deposited at once at The Hague in the Ministry for Foreign Affairs.

The Netherlands Government shall give notice every month to the Signatory Powers of the ratifications which it shall have received in the interval.

As soon as the ratifications of all the signatory Powers, as much for themselves as for their colonies, possessions, protectorates and leased territories, shall have been received by the Netherlands Government, this government shall give notice to all the Powers who shall have ratified the Convention, of the date on which the last of such acts of ratification shall have been received.

Article 24

The present Convention shall go into effect three months after the date mentioned in the Netherlands Government's notification, as indicated in the last paragraph of the preceding article.

With regard to the laws, regulations and other measures provided for by the present Convention, it is agreed that the drafts necessary to this end shall be drawn up not later than six months after the going into effect of the Convention. With regard to the laws, these shall also be proposed by the Governments to their parliaments or legislative bodies within this same period of six months, and in any case at the first session which shall follow the expiration of this period.

The date from which these laws, regulations, or measures shall go into effect shall be the subject of an agreement between the signatory Powers, at the instance of the Netherlands Government.

In case questions shall arise relative to the ratification of the present Convention, or relative to the going into effect of the Convention, or of the laws, regulations and measures which such Convention involves, the Netherlands Government, if these questions cannot be decided by other means, shall invite all the Signatory Powers to designate delegates who shall assemble at The Hague to come to an immediate agreement on these questions.

Article 25

If it should happen that one of the Contracting Powers should wish to denounce the present Convention, such denunciation shall be notified in writing to the Netherlands Government, who shall immediately communicate a certified copy in conformity with such notification to all the other Powers, informing them at the same time as to the date on which it received such notification.

The denunciation shall have no effect except with respect to the Power who shall have given notice thereof and one year after such notice shall have reached the Netherlands Government.

In witness whereof, the Plenipotentiaries have affixed their signatures to the present Convention.

Done at The Hague, January 23, 1912, in one single copy, which shall remain deposited in the archives of the Government of the Netherlands and copies of which, certified in conformity, shall be delivered through diplomatic channels to all the Powers represented at the Conference.

(Here follow signatures.)

APPENDIX II

First Opium Conference

Agreement—Protocol—Final Act

Signed at Geneva, February 11th, 1925

Agreement

The British Empire (with India), China, France, Japan, The Netherlands, Portugal and Siam,

Being fully determined to bring about the gradual and effective suppression of the manufacture of, internal trade in and use of prepared opium, as provided for in Chapter II of the International Opium Convention of January 23rd 1912, in their Far Eastern Possessions and Territories, including leased or protected territories, in which the use of prepared opium is temporarily authorized; and

Being desirous, on the grounds of humanity and for the purpose of promoting the social and moral welfare of their peoples, of taking all possible steps for achieving the suppression of the use of opium for smoking with the least possible delay;

Having decided to conclude an agreement supplementary to the said International Convention;

Have nominated for this purpose as their plenipotentiaries:

(Here follow names of plenipotentiaries)

Who, having examined the present situation in regard to the application of Chapter II of the said International Opium Convention in the above-mentioned Far Eastern possessions and territories; and

Taking note of the fact that the increase of the smuggling of opium in the greater part of the territories in the Far East since the ratification of the Convention is hampering greatly the accomplishment of the gradual and effective suppression of the manufacture of, internal trade in, and use of prepared opium, as provided for in the Convention, and is even rendering less effective some of the measures already taken for that end; and

Taking into account the different situations of the several countries,

Having deposited their full powers found in good and due form;

Have agreed as follows:—

Article I

1. Except as provided in paragraph 3 of this article with regard to retail sale, the importation, sale and distribution of opium shall be a monopoly of the

Government and the right to import, sell or distribute opium shall not be leased, accorded or delegated to any persons whatever.

2. The making of prepared opium for sale shall also be made a monopoly of the Government as soon as circumstances permit.

3. (a) The system of employing persons paid by a fixed salary and not by a commission on sales for the retail sale and distribution of opium shall be applied experimentally in those districts where an effective supervision can be exercised by the administrative authorities.

(b) Elsewhere the retail sale and distribution of opium shall be conducted only by persons licensed by the Government.

Paragraph (a) need not be applied if a system of licensing and rationing of smokers is in force which affords equivalent or more effective guarantees.

Article II

The sale of opium to minors shall be prohibited. All possible steps shall be taken by the Contracting Powers to prevent the spread of the habit of opium smoking among minors.

Article III

No minors shall be permitted to enter any smoking divan.

Article IV

The Contracting Powers shall limit as much as possible the number of retail shops and, where smoking divans are permitted, the number of divans.

Article V

The purchase and sale of "dross," except when the "dross" is sold to the monopoly, is prohibited.

Article VI

(1) The export of opium, whether raw or prepared, from any Possession or Territory into which opium is imported for the purpose of smoking shall be prohibited.

(2) The transit through, or transshipment in, any such Possession or Territory of prepared opium shall be prohibited.

(3) The transit through, or transshipment in, any such Possession or Territory of raw opium consigned to a destination outside the Possession or Territory shall also be prohibited unless an import certificate, issued by the Government of the importing country, which can be accepted as affording sufficient guarantees against the possibility of illegitimate use, is produced to the Government of the Possession or Territory.

Article VII

The Contracting Powers shall use their utmost efforts by suitable instruction in the schools, dissemination of literature and otherwise, to discourage the use of prepared opium within their respective territories, except where a Government considers such measures to be undesirable under the conditions existing in its territory.

Article VIII

The Contracting Powers undertake to assist one another in their efforts to suppress the illicit traffic by the direct exchange of information and views between the heads of the services concerned.

Article IX

The Contracting Powers will examine in the most favourable spirit the possibility of taking legislative measures to render punishable illegitimate transactions which are carried out in another country by a person residing within their territories.

Article X

The Contracting Powers will furnish all information which they can obtain with regard to the number of opium smokers. This information shall be transmitted to the Secretary-General of the League of Nations for publication.

Article XI

The provisions of this agreement shall not apply to opium destined solely for medical and scientific purposes.

Article XII

The Contracting Powers agree that they will jointly review from time to time at such dates as may be mutually agreed, the position in regard to the application of Chapter II of the Hague Convention of January 23rd 1912, and of the present Agreement. The first meeting shall take place at latest in 1929.

Article XIII

The present Agreement applies only to the Far Eastern possessions or territories of the Contracting Powers, including leased or protected territories, in which the use of prepared opium is temporarily authorized.

At the moment of ratification any Contracting Power may declare that its acceptance of the Agreement does not include any territory over which it exercised only a protectorate; and may accede subsequently in respect of any protectorate thus excluded by means of a notification of accession deposited with the Secretary-General of the League of Nations who shall forthwith notify the accession to all the other Contracting Powers.

Article XIV

The present Agreement, of which the French and English texts are both authentic, shall be subject to ratification.

The deposit of ratification shall be made at the Secretariat of the League of Nations as soon as possible.

The Agreement shall not come into force until it has been ratified by two Powers. The date of its coming into force shall be the 90th day after the receipt by the Secretary-General of the League of Nations of the second ratification. Thereafter the Agreement shall take effect for each Contracting Power 90 days after the receipt of its ratification.

The Agreement shall be registered by the Secretary-General of the League of Nations upon the day of its coming into force.

Article XV

If one of the Contracting Powers should wish to denounce the present Agreement, the denunciation shall be notified in writing to the Secretary-General of the League of Nations who will immediately communicate a copy of the notification to all the other Powers, informing them of the date on which it was received.

The denunciation shall take effect only as regards the Power which notified it, and one year after the notification thereof has reached the Secretary-General.

In Faith Whereof the above-named plenipotentiaries have signed the present Agreement.

DONE AT GENEVA, the eleventh day of February of nineteen hundred and twenty-five, in a single copy which shall remain deposited in the archives of the Secretariat of the League of Nations, and of which authenticated copies shall be transmitted to all the Contracting Powers.

(Here follow signatures)

Protocol

The undersigned representatives of the States signatory to the Agreement relating to the use of prepared opium signed this day, duly authorised to that effect;

Anxious to ensure the complete and final execution of the obligations, and to strengthen the undertakings assumed by them under Article VI of the Hague Convention of 1912;

Taking note of the fact that the Second Opium Conference has decided to adopt a Protocol by which certain Powers are to establish within five years at latest an effective control over the production, distribution and export of raw opium, so as to prevent illicit traffic;

Hereby agree as follows:

Article I

The States signatories of the present Protocol recognize that the provisions of the Agreement signed this day are supplementary to, and designed to facilitate the execution of the obligation assumed by the Signatory States under Article VI of the Hague Convention of 1912, which obligation remains in full force and effect.

Article II

As soon as the poppy-growing countries have ensured the effective execution of the necessary measures to prevent the exportation of raw opium from their territories from constituting a serious obstacle to the reduction of consumption in the countries where the use of prepared opium is temporarily authorised, the States signatories of the present Protocol will strengthen the measures already taken in accordance with Article VI of the Hague Convention of 1912, and will take any further measures which may be necessary, in order to reduce consumption of prepared opium in the territories under their authority, so that such use may be completely suppressed within a period of not more than fifteen years from the date of the decision referred to in the following Article.

Article III

A Commission to be appointed at the proper time by the Council of the League of Nations shall decide when the effective execution of the measures, mentioned in the preceding Article, to be taken by the poppy-growing countries has reached the stage referred to in that Article. The decision of the Commission shall be final.

Article IV

In the event of any of the States signatories of the present Protocol finding at any time during the period of fifteen years referred to in Article II, that the measures to be taken by the poppy-growing countries, referred to in the said Article, are no longer being effectively executed, such State shall have the right to bring the matter to the notice of the Council of the League of Nations. If the Council, whether by the report of a Commission appointed by it to investigate and report upon the facts, or by any other information at its disposal is satisfied that the facts are as stated, the States concerned will be entitled to denounce the present Protocol. In that case a Conference of the States concerned shall at once be held to consider the action to be taken.

Article V

During the year preceding the end of the period of fifteen years referred to in Article II, a special Conference of the States signatories of the present Protocol shall be held to consider the measures to be taken in regard to habitual addicts whose pathological condition is certified by the medical authorities of the country concerned.

Article VI

The States signatories of the present Protocol will co-ordinate their efforts to effect the complete and final suppression of the use of prepared opium In order to attain this object as soon as possible the said States, recognising the difficulties at present experienced by certain Powers in establishing an effective control over the production, distribution and exportation of raw opium, make a pressing appeal to the poppy-growing countries for the establishment between all the States concerned of a sincere and energetic collaboration which will lead to the termination of the illicit traffic.

Article VII

The present Protocol shall come into force for each of the signatory States at the same time as the Agreement relating to the use of prepared opium signed this day.

Article VIII

Any State represented at the Conference at which the present Protocol was drawn up may accede to it at any time after its coming into force.

Done at Geneva, the eleventh day of February, one thousand nine hundred and twenty-five.

(Here follow signatures)

Final Act

of the

Conference on the Application in the Far East of Chapter II of the International Opium Convention of January 23rd, 1912, Convened at Geneva on November 3rd, 1924.

The Conference convened by the Council of the League of Nations in accordance with the Resolution adopted by the Assembly of the League on September 27th, 1923, met in the offices of the Secretariat of the League on November 3rd, 1924.

The Governments below enumerated took part in the Conference, for which they had appointed the following plenipotentiaries:

(Here follow names of plenipotentiaries)

At a series of meetings, the Conference drew up the supplementary Agreement and the Protocol which bear this day's date.

The Conference, with the exception of the Chinese Delegation, further adopted the following Resolution:—

"It has been pointed out to the Conference that in some countries the system of licenses (or registration) and rationing has been successful in diminishing the number of smokers.

"At the same time, the Conference has found that, in other countries, the contraband trade which equals and even surpasses in extent the legitimate trade, renders the application of this system difficult, and in the opinion of the Governments in question, useless and in some cases dangerous.

"Accordingly, the Conference declares that the possibility of adopting these measures or of maintaining them in those territories where they are now working successfully, depends principally upon the extent of the contraband trade.

"It therefore leaves to the Contracting Powers which have not yet applied this system the duty of selecting the moment when circumstances will allow of its adoption and of taking in the meantime all such preparatory measures as they may deem expedient."

The Representative of the British Empire declared that he signed the Protocol subject to the following declaration:—

"I declare that my signature of this Protocol is subject, in respect of British Protectorates, to the conditions contained in Article XIII of the Agreement signed this day."

The Representative of Portugal, on signing the Agreement, made the following declarations:—

1. "The Portuguese Government, while accepting the principle of a monopoly as formulated in Article I, does so, as regards the moment at which the measures provided for in the first paragraph thereof shall come into force, subject to the limitation contained in the second paragraph of the article.

2. "The Portuguese Government being bound by a contract consistent with the provisions of the Hague Convention of 1912, will not be able to put into operation the provisions of paragraph 1 of Article 6 of the present Agreement so long as its obligations under this contract are in force."

The Representative of Siam declared that he signed the Agreement subject to the following declaration:—

"The Siamese Delegation is instructed to sign the Agreement under reservation of Article I, paragraph 3 (a) with regard to the time when this provision shall come into force and of Article V. The reason for these reservations has been stated by the First Delegate of Siam on the 14th November, 1924 The Siamese Government is hoping to put into force the system of registration and rationing within the period of three years. After that date, the reservation in regard to Article I, paragraph 3 (a) will fall to the ground."

IN WITNESS WHEREOF, the above-named plenipotentiaries have signed the present Act.

DONE AT GENEVA, the eleventh day of February, nineteen hundred and twenty-five in a single copy which shall remain deposited in the Secretariat of the League of Nations and of which authenticated copies shall be transmitted to all the Powers represented at the Conference.

(Here follow signatures)

APPENDIX III

Second Opium Conference

Convention—Protocol—Final Act

Signed at Geneva on February 19th, 1925

Convention

Taking note of the fact that the application of the provisions of the Hague Convention of January 23rd, 1912, by the Contracting Parties has produced results of great value, but that the contraband trade in and abuse of the substances to which the Convention applies still continue on a great scale;

Convinced that the contraband trade in and abuse of these substances cannot be effectually suppressed except by bringing about a more effective limitation of the production or manufacture of the substances, and by exercising a closer control and supervision of the international trade, than are provided for in the said Convention;

Desirous therefore of taking further measures to carry out the objects aimed at by the said Convention and to complete and strengthen its provisions:

Realising that such limitation and control require the close co-operation of all the Contracting Parties;

Confident that this humanitarian effort will meet with the unanimous adhesion of the nations concerned;

Have decided to conclude a Convention for this purpose.

The High Contracting Parties have accordingly appointed as their Plenipotentiaries:

(Here follow the names of heads of States and their Plenipotentiaries)

who, after communicating their full powers, found in good and due form, have agreed as follows:

CHAPTER I.—Definitions

Article 1

The Contracting Parties agree to adopt the following definitions for the purposes of the present Convention:

Raw Opium—"Raw opium" means the spontaneously coagulated juice obtained from the capsules of the Papaver somniferum L., which has only been submitted to the necessary manipulations for packing and transport, whatever its content of morphine.

Medicinal Opium—"Medicinal opium" means raw opium which has undergone the processes necessary to adapt it for medicinal use in accordance with the requirements of the national pharmacopoeia, whether in powder form or granulated or otherwise or mixed with neutral materials.

Morphine—"Morphine" means the principal alkaloid of opium having the chemical formula $C_{17}H_{19}NO_3$.

Diacetylmorphine—"Diacetylmorphine" means diacetylmorphine (diamorphine, heroin) having the formula $C_{21}H_{23}NO_5$.

Coca Leaf—"Coca leaf" means the leaf of the Erythroxylon Coca Lamarck and the Erythroxylon novo-granatense (Morris) Hieronymus and their varieties, belonging to the family of Erythoxylaceae and the leaf of other species of this genus from which it may be found possible to extract cocaine either directly or by chemical transformation.

Crude Cocaine—"Crude cocaine" means any extract of the coca leaf which can be used directly or indirectly for the manufacture of cocaine.

Cocaine—"Cocaine" means methyl-benzoyl laevo-ecgonine ([a] $D20^{0} = -16^{0}4$) in 20 per cent solution of chloroform, of which the formula is $C_{17}H_{21}NO_4$.

Ecgonine—"Ecogonine" means laevo-ecgonine ([A] $D20^{0} = -45^{0}6$ in 5 per cent solution of water), of which the formula $C_9H_{15}NO_3$. H_2O, and all the derivatives of laevo-ecgonine which might serve industrially for its recovery.

Indian Hemp—"Indian hemp" means the dried flowering or fruiting tops of the pistillate plant Cannabis sativa L. from which the resin has not been extracted, under whatever name they may be designated in commerce.

CHAPTER II.—Internal Control of Raw Opium and Coca Leaves

Article 2

The Contracting Parties undertake to enact laws and regulations to ensure the effective control of the production, distribution and export of raw opium, unless laws and regulations on the subject are already in existence; they also undertake to review periodically, and to strengthen as required, the laws and regulations on the subject which they have enacted in virtue of Article I of the Hague Convention of 1912 or of the present Convention.

Article 3

Due regard being had to the differences in their commercial conditions, the Contracting Parties shall limit the number of towns, ports or other localities through which the export or import of raw opium or coca leaves shall be permitted.

CHAPTER III.—Internal Control of Manufactured Drugs

Article 4

The provisions of the present Chapter apply to the following substances:

(a) Medicinal opium;
(b) Crude cocaine and ecgonine;
(c) Morphine, diacetylmorphine, cocaine and their respective salts;

(d) All preparations officinal and non-officinal (including the so-called anti-opium remedies) containing more than 0.2 per cent of morphine or more than 0.1 per cent of cocaine;
(e) All preparations containing diacetylmorphine;
(f) Galenical preparations (extract and tincture) of Indian hemp;
(g) Any other narcotic drug to which the present Convention may be applied in accordance with Article 10.

Article 5

The Contracting Parties shall enact effective laws or regulations to limit exclusively to medical and scientific purposes the manufacture, import, sale, distribution, export and use of the substances to which this Chapter applies. They shall co-operate with one another to prevent the use of these substances for any other purposes.

Article 6

The Contracting Parties shall control all persons manufacturing, importing, selling, distributing or exporting the substances to which this Chapter applies, as well as the buildings in which these persons carry on such industry or trade.

With this object, the Contracting Parties shall:

(a) Confine the manufacture of the substances referred to in Article 4 (b), (c) and (g) to those establishments and premises alone which have been licensed for the purpose.

(b) Require that all persons engaged in the manufacture, import, sale, distribution, or export of the said substances shall obtain a license or permit to engage in these operations;

(c) Require that such persons shall enter in their books the quantities manufactured, imports, exports, sales and all other distribution of the said substances. This requirement shall not necessarily apply either to supplies dispensed by medical practitioners or to sales by duly authorised chemists on medical prescriptions, provided in each case that the medical prescriptions are filed and preserved by the medical practitioner or chemist.

Article 7

The Contracting Parties shall take measures to prohibit, as regards their internal trade, the delivery to or possession by any unauthorised persons of the substances to which this Chapter applies.

Article 8

In the event of the Health Committee of the League of Nations, after having submitted the question for advice and report to the Permanent Committee of the Office international d'Hygiène publique in Paris, finding that any preparation containing any of the narcotic drugs referred to in the present Chapter cannot give rise to the drug habit on account of the medicaments with which the said drugs are compounded and which in practice preclude the recovery of the said drugs, the Health Committee shall communicate this finding to the Council of the League of Nations. The Council will communicate the finding to the Contracting Parties, and thereupon the provisions of the present Convention will not be applicable to the preparation concerned.

Article 9

Any Contracting Party may authorise the supply to the public by chemists, at their own discretion, as medicines, for immediate use in urgent cases, of the following opiate official preparations: tincture of opium, Sydenham laudanum and Dover powder. The maximum dose, however, which may be supplied in such cases must not contain more than 25 centigrammes of officinal opium, and the chemist must enter in his books the quantities supplied, as provided in Article 6 (c).

Article 10

In the event of the Health Committee of the League of Nations, after having submitted the question for advice and report to the Permanent Committee of the Office international d'Hygiène publique in Paris, finding that any narcotic drug to which the present Convention does not apply is liable to similar abuse and productive of similar ill-effects as the substances to which this Chapter of the Convention applies, the Health Committee shall inform the Council of the League accordingly and recommend that the provisions of the present Convention shall be applied to such drug.

The Council of the League shall communicate the said recommendation to the Contracting Parties. Any Contracting Party which is prepared to accept the recommendation shall notify the Secretary-General of the League, who will inform the other Contracting Parties.

The provisions of the present Convention shall thereupon apply to the substance in question as between the Contracting Parties who have accepted the recommendation referred to above.

CHAPTER IV.—Indian Hemp

Article 11

1. In addition to the provisions of Chapter V of the present Convention, which shall apply to Indian hemp and the resin prepared from it, the Contracting Parties undertake:

(a) To prohibit the export of the resin obtained from Indian hemp and the ordinary preparations of which the resin forms the base (such as hashish, esrar, chiras, djamba) to countries which have prohibited their use, and, in cases where export is permitted, to require the production of a special import certificate issued by the Government of the importing country stating that the importation is approved for the purposes specified in the certificate and that the resin or preparations will not be re-exported;

(b) Before issuing an export authorisation under Article 13 of the present Convention, in respect of Indian hemp, to require the production of a special import certificate issued by the Government of the importing country and stating that the importation is approved and is required exclusively for medical or scientific purposes.

2. The Contracting Parties shall exercise an effective control of such a nature as to prevent the illicit international traffic in Indian hemp and especially in the resin.

CHAPTER V.—Control of International Trade

Article 12

Each Contracting Party shall require a separate import authorisation to be obtained for each importation of any of the substances to which the present Convention applies. Such authorisation shall state the quantity to be imported, the name and address of the importer and the name and address of the exporter.

The import authorisation shall specify the period within which the importation must be effected and may allow the importation in more than one consignment.

Article 13

1. Each Contracting Party shall require a separate export authorisation to be obtained for each exportation of any of the substances to which the present Convention applies. Such authorisation shall state the quantity to be exported, the name and address of the exporter and the name and address of the importer.

2. The Contracting Party, before issuing such export authorisation, shall require an import certificate, issued by the Government of the importing country and certifying that the importation is approved, to be produced by the person or establishment applying for the export authorisation.

Each Contracting Party agrees to adopt, so far as possible, the form of import certificate annexed to the present Convention.

3. The export authorisation shall specify the period within which the exportation must be effected, and shall state the number and date of the import certificate and the authority by whom it has been issued.

4. A copy of the export authorisation shall accompany the consignment, and the Government issuing the export authorisation shall send a copy to the Government of the importing country.

5. The Government of the importing country, when the importation has been effected, or when the period fixed for the importation has expired, shall return the export authorisation, with an endorsement to that effect, to the Government of the exporting country. The endorsement shall specify the amount actually imported.

6. If a less quantity than that specified in the export authorisation is actually exported, the quantity actually exported shall be noted by the competent authorities on the export authorisation and on any official copy thereof.

7. In the case of an application to export a consignment to any country for the purpose of being placed in a bonded warehouse in that country, a special certificate from the Government of that country, certifying that it has approved the introduction of the consignment for the said purpose, may be accepted by the Government of the exporting country in place of the import certificate

provided for above. In such a case, the export authorisation shall specify that the consignment is exported for the purpose of being placed in a bonded warehouse.

Article 14

For the purpose of ensuring the full application and enforcement of the provisions of the present Convention in free ports and free zones, the Contracting Parties undertake to apply in free ports and free zones situated within their territories the same laws and regulations, and to exercise therein the same supervision and control, in respect of the substances covered by the said Convention, as in other parts of their territories.

This Article does not, however, prevent any Contracting Party from applying, in respect of the said substances, more drastic provisions in its free ports and free zones than in other parts of its territories.

Article 15

1. No consignment of any of the substances covered by the present Convention which is exported from one country to another country shall be permitted to pass through a third country, whether or not it is removed from the ship or conveyance in which it is being conveyed, unless the copy of the export authorisation (or the diversion certificate, if such a certificate has been issued in pursuance of the following paragraph) which accompanies the consignment is produced to the competent authorities of that country.

2. The competent authorities of any country through which a consignment of any of the substances covered by the present Convention is permitted to pass shall take all due measures to prevent the diversion of the consignment to a destination other than that named in the copy of the export authorisation (or the diversion certificate) which accompanies it, unless the Government of that country has authorised that diversion by means of a special diversion certificate. A diversion certificate shall only be issued after the receipt of an import certificate, in accordance with Article 13, from the Government of the country to which it is proposed to divert the consignment, and shall contain the same particulars as are required by Article 13 to be stated in an export authorisation, together with the name of the country from which the consignment was originally exported. All the provisions of Article 13 which are applicable to an export authorisation shall be applicable equally to the diversion certificate.

Further, the Government of the country authorising the diversion of the consignment shall detain the copy of the original export authorisation (or diversion certificate) which accompanied the consignment on arrival in its territory, and shall return it to the Government which issued it, at the same time notifying the name of the country to which the diversion has been authorised.

3. In cases where the transport is being effected by air, the preceding provisions of this Article shall not be applicable if the aircraft passes over the territory of the third country without landing. If the aircraft lands in the territory of the said country, the said provisions shall be applied so far as the circumstances permit.

4. Paragraphs 1 to 3 of this Article are without prejudice to the provisions

of any international agreement which limits the control which may be exercised by any of the Contracting Parties over the substances to which the present Convention applies when in direct transit.

5. The provisions of this Article shall not apply to transport of the substances by post.

Article 16

A consignment of any of the substances covered by the present Convention which is landed in the territory of any Contracting Party and placed in a bonded warehouse shall not be withdrawn from the bonded warehouse unless an import certificate, issued by the Government of the country of destination and certifying that the importation is approved, is produced to the authorities having jurisdiction over the bonded warehouse. A special authorisation shall be issued by the said authorities in respect of each consignment so withdrawn and shall take the place of the export authorisation for the purpose of Articles 13, 14, and 15 above.

Article 17

No consignment of the substances covered by the present Convention while passing in transit through the territories of any Contracting Party or whilst being stored there in a bonded warehouse may be subjected to any process, which would alter the nature of the substances in question or, without the permission of the competent authorities, the packing.

Article 18

If any Contracting Party finds it impossible to apply any provision of this Chapter to trade with another country by reason of the fact that such country is not a party to the present Convention, such Contracting Party will only be bound to apply the provisions of this Chapter so far as the circumstances permit.

CHAPTER VI.—Permanent Central Board

Article 19

A Permanent Central Board shall be appointed, within three months from the coming into force of the present Convention.

The Central Board shall consist of eight persons who, by their technical competence, impartiality and disinterestedness, will command general confidence.

The members of the Central Board shall be appointed by the Council of the League of Nations.

The United States of America and Germany shall be invited each to nominate one person to participate in these appointments.

In making the appointments, consideration shall be given to the importance of including on the Central Board, in equitable proportion, persons possessing a knowledge of the drug situation, both in the producing and manufacturing countries on the one hand and in the consuming countries on the other hand, and connected with such countries.

The members of the Central Board shall not hold any office which puts them in a position of direct dependence on their Governments.

The members shall be appointed for a term of five years, and they will be eligible for re-appointment.

The Central Board shall elect its own President and shall settle its rules of procedure.

At meetings of the Board, four members shall form a quorum.

The decisions of the Board relative to Articles 24 and 26 shall be taken by an absolute majority of the whole number of the Board.

Article 20

The Council of the League of Nations shall, in consultation with the Board, make the necessary arrangements for the organisation and working of the Board, with the object of assuring the full technical independence of the Board in carrying out its duties under the present Convention, while providing for the control of the staff in administrative matters by the Secretary-General.

The Secretary-General shall appoint the secretary and staff of the Board on the nomination of the Board and subject to the approval of the Council.

Article 21

The Contracting Parties agree to send in annually before December 31st, to the Permanent Central Board set up under Article 19, estimates of the quantities of each of the substances covered by the Convention to be imported into their territory for internal consumption during the following year for medical, scientific and other purposes.

These estimates are not to be regarded as binding on the Government concerned, but will be for the purpose of serving as a guide to the Central Board in the discharge of its duties.

Should circumstances make it necessary for any country, in the course of the year, to modify its estimates, the country in question shall communicate the revised figures to the Central Board.

Article 22

1. The Contracting Parties agree to send annually to the Central Board, in a manner to be indicated by the Board, within three (in the case of paragraph (c) five) months after the end of the year, as complete and accurate statistics as possible relative to the preceding year, showing:

(a) Production of raw opium and coca leaves;

(b) Manufacture of the substances covered by Chapter III, Article 4 (b), (c) and (g) of the present Convention and the raw material used for such manufacture. The amount of such substances used for the manufacture of other derivatives not covered by the Convention shall be separately stated;

(c) Stocks of the substances covered by Chapters II and III of the present Convention in the hands of wholesalers or held by the Government for consumption in the country for other than Government purposes;

(d) Consumption, other than for Government purposes, of the substances covered by Chapters II and III of the present Convention;

(e) Amounts of each of the substances covered by the present Convention which have been confiscated on account of illicit import or export; the manner in which the confiscated substances have been disposed of shall be stated, together with such other information as may be useful in regard to such confiscation and disposal.

The statistics referred to in paragraphs (a) to (e) above shall be communicated by the Central Board to the Contracting Parties.

2. The Contracting Parties agree to forward to the Central Board, in a manner to be prescribed by the Board, within four weeks after the end of each period of three months, the statistics of their imports from and exports to each country of each of the substances covered by the present Convention during the preceding three months. These statistics will, in such cases as may be prescribed by the Board, be sent by telegram, except when the quantities fall below a minimum amount which shall be fixed in the case of each substance by the Board.

3. In furnishing the statistics in pursuance of this Article, the Governments shall state separately the amounts imported or purchased for Government purposes, in order to enable the amounts required in the country for general medical and scientific purposes to be ascertained. It shall not be within the competence of the Central Board to question or to express any opinion on the amounts imported or purchased for Government purposes or the use thereof.

4. For the purposes of this Article, substances which are held, imported, or purchased by the Government for eventual sale are not regarded, as held, imported or purchased for Government purposes.

Article 23

In order to complete the information of the Board as to the disposal of the world's supply of raw opium, the Governments of the countries where the use of prepared opium is temporarily authorised shall, in a manner to be prescribed by the Board, in addition to the statistics provided for in Article 22, forward annually to the Board, within three months after the end of the year, as complete and accurate statistics as possible relative to the preceding year showing:

(1) The manufacture of prepared opium, and the raw material used for such manufacture;

(2) The consumption of prepared opium.

It is understood that it shall not be within the competence of the Board to question or to express any opinion upon these statistics, and that the provisions of Article 24 are not applicable to the matters dealt with in this Article, except in cases where the Board may find that illicit international transactions are taking place on an appreciable scale.

Article 24

1. The Central Board shall continuously watch the course of the international trade. If the information at its disposal leads the Board to conclude that excessive quantities of any substance covered by the present Convention are accumulating in any country, or that there is a danger of that country becoming a centre of the illicit traffic, the Board shall have the right to ask, through the Secretary-General of the League, for explanations from the country in question.

2. If no explanation is given within a reasonable time or the explanation is unsatisfactory, the Central Board shall have the right to call the attention of the Governments of all the Contracting Parties and of the Council of the League of Nations to the matter, and to recommend that no further exports of the substances covered by the present Convention or any of them shall be made to the country concerned until the Board reports that it is satisfied as to the situation in that country in regard to the said substances. The Board shall at the same time notify the Government of the country concerned of the recommendation made by it.

3. The country concerned shall be entitled to bring the matter before the Council of the League.

4. The Government of any exporting country which is not prepared to act on the recommendation of the Central Board shall also be entitled to bring the matter before the Council of the League.

If it does not do so, it shall immediately inform the Board that it is not prepared to act on the recommendation, explaining, if possible, why it is not prepared to do so.

5. The Central Board shall have the right to publish a report on the matter and communicate it to the Council, which shall thereupon forward it to the Governments of all the Contracting Parties.

6. If in any case the decision of the Central Board is not unanimous, the views of the minority shall also be stated.

7. Any country shall be invited to be represented at a meeting of the Central Board at which a question directly interesting it is considered.

Article 25

It shall be the friendly right of any of the Contracting Parties to draw the attention of the Board to any matter which appears to it to require investigation, provided that this Article shall not be construed as in any way extending the powers of the Board.

Article 26

In the case of a country which is not a party to the present Convention, the Central Board may take the same measures as are specified in Article 24, if the information at the disposal of the Board leads it to conclude that there is a danger of the country becoming a centre of the illicit traffic; in that case the Board shall take the action indicated in the said Article as regards notification to the country concerned.

Paragraphs 3, 4 and 7 of Article 24 shall apply in any such case.

Article 27

The Central Board shall present an annual report on its work to the Council of the League. This report shall be published and communicated to all Contracting Parties.

The Central Board shall take all necessary measures to ensure that the estimates, statistics, information and explanations which it receives under Articles 21, 22, 23, 24, 25, or 26 of the present Convention shall not be made public in such a manner as to facilitate the operations of speculators or injure the legitimate commerce of any Contracting Party.

CHAPTER VII.—General Provisions

Article 28

Each of the Contracting Parties agrees that breaches of its laws or regulations by which the provisions of the present Convention are enforced shall be punishable by adequate penalties, including in appropriate cases the confiscation of the substances concerned.

Article 29

The Contracting Parties will examine in the most favourable spirit the possibility of taking legislative measures to render punishable acts committed within their jurisdiction for the purpose of procuring or assisting the commission in any place outside their jurisdiction of any act which constitutes an offence against the laws of that place relating to the matters dealt with in the present Convention.

Article 30

The Contracting Parties shall communicate to one another, through the Secretary-General of the League of Nations, their existing laws and regulations, respecting the matters referred to in the present Convention, so far as this has not already been done, as well as those promulgated in order to give effect to the said Convention.

Article 31

The present Convention replaces, as between the Contracting Parties, the provisions of Chapters I, III and V of the Convention signed at The Hague on January 23rd, 1912, which provisions remain in force as between the Contracting Parties and any States Parties to the said Convention which are not Parties to the present Convention.

Article 32

1. In order as far as possible to settle in a friendly manner disputes arising between the Contracting Parties in regard to the interpretation or application of the present Convention which they have not been able to settle through diplomatic channels, the parties to such a dispute may, before resorting to any proceedings for judicial settlement or arbitration, submit the dispute for an advisory opinion to such technical body as the Council of the League of Nations may appoint for this purpose.

2. The advisory opinion shall be given within six months commencing from the day on which the dispute has been submitted to the technical body, unless this period is prolonged by mutual agreement between the parties to the dispute. The technical body shall fix the period within which the parties are to decide whether they will accept the advisory opinion given by it.

3. The advisory opinion shall not be binding upon the parties to the dispute unless it is accepted by each of them.

4. Disputes which it has not been found possible to settle either directly or on

the basis of the advice of the above-mentioned technical body shall, at the request of any one of the parties thereto, be brought before the Permanent Court of International Justice, unless a settlement is attained by way of arbitration or otherwise by application of some existing convention or in virtue of an arrangement specially concluded.

5. Proceedings shall be opened before the Permanent Court of International Justice in the manner laid down in Article 40 of the Statute of the Court.

6. A decision of the parties to a dispute to submit it for an advisory opinion to the technical body appointed by the Council of the League of Nations, or to resort to arbitration, shall be communicated to the Secretary-General of the League of Nations and by him to the other Contracting Parties, which shall have the right to intervene in the proceedings.

7. The parties to a dispute shall bring before the Permanent Court of International Justice any question of international law or questions as to the interpretation of the present Convention arising during proceedings before the technical body or arbitral tribunal, decision of which by the Court is, on the demand of one of the parties, declared by the technical body or arbitral tribunal to be necessary for the settlement of the dispute.

Article 33

The present Convention, of which the French and English texts are both authentic, shall bear to-day's date and shall be open for signature until the 30th day of September, 1925, by any State represented at the Conference at which the present Convention was drawn up, by any Member of the League of Nations, and by any State to which the Council of the League of Nations shall have communicated a copy of the Convention for this purpose.

Article 34

The present Convention, is subject to ratification. The instruments of ratification shall be deposited with the Secretary-General of the League of Nations, who shall notify their receipt to the Members of the League which are signatories of the Convention and to the other signatory States.

Article 35

After the 30th day of September, 1925, the present Convention may be acceded to by any State represented at the Conference at which this Convention was drawn up and which has not signed the Convention, by any Member of the League of Nations, or by any State to which the Council of the League of Nations shall have communicated a copy of the Convention for this purpose.

Accession shall be effected by an instrument communicated to the Secretary-General of the League of Nations to be deposited in the archives of the Secretariat. The Secretary-General shall at once notify such deposit to all the Members of the League of Nations signatories of the Convention and to the other signatory States.

Article 36

The present Convention shall not come into force until it has been ratified by ten Powers, including seven of the States by which the Central Board is to be appointed in pursuance of Article 19, of which at least two must be permanent Members of the Council of the League. The date of its coming into force shall be the ninetieth day after the receipt by the Secretary-General of the League of Nations of the last of the necessary ratifications. Thereafter, the present Convention will take effect in the case of each Party ninety days after the receipt of its ratification or of the notification of its accession.

In compliance with the provisions of Article 18 of the Covenant of the League of Nations, the Secretary-General will register the present Convention upon the day of its coming into force.

Article 37

A special record shall be kept by the Secretary-General of the League of Nations showing which of the Parties have signed, ratified, acceded to or denounced the present Convention. This record shall be open to the Contracting Parties and the Members of the League at all times; it shall be published as often as possible, in accordance with the directions of the Council.

Article 38

The present Convention may be denounced by an instrument in writing addressed to the Secretary-General of the League of Nations. The denunciation shall become effective one year after the date of the receipt of the instrument of denunciation by the Secretary-General, and shall operate only in respect of the Contracting Party which makes it.

The Secretary-General of the League of Nations shall notify the receipt of any such denunciations to all Members of the League of Nations signatories of or adherents to the Convention and to the other signatory or adherent States.

Article 39

Any State signing or acceding to the present Convention may declare, at the moment either of its signature, ratification or accession, that its acceptance of the present Convention does not include any or all of its colonies, overseas possession, protectorates, or overseas territories under its sovereignty or authority, or in respect of which it has accepted a mandate on behalf of the League of Nations, and may subsequently accede, in conformity with the provisions of Article 35, on behalf of any such colony, overseas possession, protectorate or territory excluded by such declaration.

Denunciation may also be made separately in respect of any such colony, overseas possession, protectorate or territory, and the provisions of Article 38 shall apply to any such denunciation.

In faith whereof the above-named Plenipotentiaries have signed the present Convention.

DONE AT GENEVA, the nineteenth day of February, one thousand nine hundred and twenty-five, in a single copy, which will remain deposited in the archives of the Secretariat of the League of Nations; certified copies will be transmitted to all the States represented at the Conference and to all Members of the League of Nations.

(Here follow signatures)

Protocol

The undersigned, representatives of certain States signatory to the Convention relating to Dangerous Drugs signed this day, duly authorized to that effect;

Taking note of the Protocol signed the eleventh day of February one thousand nine hundred and twenty-five by the representatives of the States signatory to the Agreement signed on the same day relating to the Use of Prepared Opium:

Hereby agree as follows:

I

The States signatory to the present Protocol, recognising that under Chapter I of the Hague Convention the duty rests upon them of establishing such a control over the production, distribution and exportation of raw opium as would prevent the illicit traffic, agree to take such measures as may be required to prevent completely, within five years from the present date, the smuggling of opium from constituting a serious obstacle to the effective suppression of the use of prepared opium in those territories where such use is temporarily authorised.

II

The question whether the undertaking referred to in Article I has been completely executed shall be decided, at the end of the said period of five years, by a Commission to be appointed by the Council of the League of Nations.

III

The present Protocol shall come into force for each of the signatory States at the same time as the Convention relating to Dangerous Drugs signed this day. Articles 33 and 35 of the Convention are applicable to the present Protocol.

In faith whereof the present Protocol was drawn up at Geneva the nineteenth day of February, 1925, in a single copy, which will remain deposited in the archives of the Secretariat of the League of Nations; certified copies will be transmitted to all States represented at the Conference and to all Members of the League of Nations.

(Here follow signatures)

Final Act

The Second International Opium Conference, convoked in accordance with the resolution of the Assembly of the League of Nations dated September 27th, 1923, met on November 17th, 1924, at the Palais des Nations, Geneva.

The resolution of the Assembly was in the following terms:

> "The Assembly, having noted with satisfaction that, in accordance with the hope expressed in the fourth resolution adopted by the Assembly in 1922, the Advisory Committee has reported that the information now available makes it possible for the Governments concerned to examine, with a view to the conclusion of an agreement, the question of the limitation of the amounts of morphine, heroin or cocaine and their respective salts to be manufactured; of the limitation of the amounts of raw opium and coca

> leaf to be imported for that purpose and for other medicinal and scientific purposes; and of the limitation of the production of raw opium and the coca leaf for export to the amount required for such medicinal and scientific purposes. requests the Council—as a means of giving effect to the principles submitted by the representatives of the United States of America, and to the policy which the League, on the recommendation of the Advisory Committee, has adopted—to invite the Governments concerned to send representatives with plenipotentiary powers to a conference for this purpose, to be held, if possible, immediately after the conference mentioned in Resolution V.
>
> "The Assembly also suggests, for the consideration of the Council, the advisability of enlarging this conference so as to include all countries which are Members of the League or Parties to the Convention of 1912, with a view to securing their adhesion to the principles that may be embodied in any agreement reached."

The Council of the League nominated as President of the Conference:

His Excellency M. Herluf Zahle, Envoy Extraordinary and Minister Plenipotentiary of Denmark to Berlin.

The Secretary-General of the League of Nations nominated as Secretary-General of the Conference; Dame Rachel Crowdy.

The following States participated in the conference, and for this purpose appointed the delegations, whose members are set out below:

(Here follow names of plenipotentiaries)

The Conference held meetings between November 17th, 1924, and February 19th, 1925.

The Conference adopted the Convention relating to Dangerous Drugs which bears today's date.

The Conference also adopted the Protocol bearing today's date.

The Conference also adopted the following resolutions:

I

The Conference recognises that, to enable the Convention relating to Dangerous Drugs, signed this day to produce its full effect, it is essential that it should be applied as widely as possible in the colonies, possessions, protectorates and territories mentioned in Article 39 of the Convention. The Conference accordingly expresses the earnest hope that the Governments concerned will take the necessary steps to that end with as little delay as possible, and that the number of such colonies, possessions, protectorates or territories excluded from the operation of the Convention may be reduced to a minimum.

II

The Conference recommends that each Government should consider the possibility of forbidding the conveyance in any ship sailing under its flag of any consignment of the substances covered by the Convention:

(1) Unless an export authorisation has been issued in respect of such consignment in accordance with the provisions of the Convention, and the

consignment is accompanied by an official copy of such authorisation, or of any diversion certificate which may be issued;

(2) To any destination other than the destination mentioned in the export authorisation or diversion certificate.

III

The Conference recommends that all States should co-operate as closely as possible with one another in the suppression of the illicit traffic, and that they should authorise the competent authorities charged with the administration of the law on the subject to communicate directly with the corresponding authorities in other countries.

IV

The Conference draws attention to the advisability in certain cases of requiring dealers who are licensed by the Government to trade in the substances covered by the Convention to deposit or give sureties for a sum of money sufficient to serve as an effective guarantee against their engaging in the illicit traffic.

V

The Conference asks the Council of the League of Nations to examine the suggestion which has been made in the course of its proceedings, in particular by the Persian delegation, that a commission should be appointed to visit certain opium-producing countries, should those countries so desire, for the purpose of making a careful study (in collaboration with the Governments of those countries) of the difficulties connected with the limitation of the production of opium in those countries and advising as to the measures which could be taken to make it possible to limit the production of opium in those countries to the quantities required for medical and scientific purposes.

VI

The Conference asks the Council of the League of Nations to invite the Health Committee to consider immediately whether it would be expedient to consult the International Health Office regarding the products mentioned in Articles 8 and 10, in order that, if so, a decision concerning preparations which cannot give rise to the drug habit and a recommendation concerning all other drugs which might come under the provisions of the Convention may be notified immediately upon the entry into force of the said Convention.

VII

The Conference requests the Council of the League of Nations to decide to include in the expenses of the Secretariat the expenses of the Central Board and its administrative services.

It is understood that those Contracting Parties which are not Members of the League will bear their share of the expenses in accordance with a scale to be drawn up by agreement with the Council.

At the moment of signing the present Act, the delegate of Persia made the following declaration

> "The Persian Delegate, acting on instructions from his Government, declares that he signs the Convention *ad referendum* and subject to the League of Nations acceding to Persia's request as set forth in its memorandum."

At the moment of signing the present Act, the delegate of Siam made the following declaration:

> "In signing the Convention and the present Final Act, the Siamese delegation wishes to declare that, having no instructions on the subject of Indian hemp, which was not originally on the agenda of the Conference, the Siamese delegation is obliged to make reservation of Chapter III in regard to galenical preparations of Indian hemp and of Chapters IV and V solely in regard to Indian hemp."

In faith whereof the delegates have signed the present Act.

DONE AT GENEVA, the nineteenth day of February, one thousand nine hundred and twenty-five, in a single copy, which shall be deposited in the archives of the Secretariat of the League of Nations, and of which authenticated copies shall be delivered to all States represented at the Conference.

(Here follow the signatures)

APPENDIX IV

Act of May 26, 1922

Narcotic Drugs Import and Export Act

(Jones-Miller Act)

(Public—No. 227—67th Congress)
(H. R. 2193)

An Act to amend the Act entitled "An Act to prohibit the importation and use of opium for other than medicinal purposes," approved February 9, 1909, as amended.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That sections 1 and 2 of the Act entitled "An Act to prohibit the importation and the use of opium for other than medicinal purposes," approved February 9, 1909, as amended, are amended to read as follows:

"That when used in this Act—

"(a) The term *narcotic drug* means opium, coca leaves, or cocaine, or any salt, derivative, or preparation of opium, coca leaves, or cocaine;

"(b) The term *United States,* when used in a geographical sense, includes the several States and Territories, and the District of Columbia;

"(c) The term *board* means the Federal Narcotics Control Board established by section 2 of this Act; and

"(d) The term *person* means individual, partnership, corporation, or association.

"SECTION 2. (a) That there is hereby established a board to be known as the *Federal Narcotics Control Board* and to be composed of the Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce. Except as otherwise provided in this Act or by other law, the administration of this Act is vested in the Department of the Treasury.

"(b) That it is unlawful to import or bring any narcotic drug into the United States or any territory under its control or jurisdiction; except that such amounts of crude opium and coca leaves as the Board finds to be necessary to provide for medical and legitimate uses only, may be imported and brought into the United States or such territory under such regulations as the board shall prescribe. All narcotic drugs imported under such regulations shall be subject to the duties which are now or may hereafter be imposed upon such drugs when imported.

"(c) That if any person fraudulently or knowingly imports or brings any narcotic drug into the United States or any territory under its control or jurisdiction, contrary to law, or assists in so doing, or receives, conceals, buys, sells, or in any manner facilitates the transportation, concealment, or sale of any such narcotic drug after being imported or brought in, knowing the same to have been imported contrary to law, such person shall upon conviction be fined not more than $5,000 and imprisoned for not more than ten years.

"(d) Any narcotic drug imported or brought into the United States or any territory under its control or jurisdiction, contrary to law, shall (1) if smoking opium or opium prepared for smoking, be seized and summarily forfeited to the United States Government without the necessity of instituting forfeiture proceedings of any character; or (2), if any other narcotic drug, be seized and forfeited to the United States Government, without regard to its value, in the manner provided by sections 3075 and 3076 of the Revised Statutes, or the provisions of law hereafter enacted which are amendatory of, or in substitution for, such sections. Any narcotic drug which is forfeited in a proceeding for condemnation or not claimed under such sections, or which is summarily forfeited as provided in this subdivision, shall be placed in the custody of the board and in its discretion be destroyed or delivered to some agency of the United States Government for use for medical or scientific purposes.

"(e) Any alien who at any time after his entry is convicted under subdivision (c) shall, upon the termination of the imprisonment imposed by the court upon such conviction and upon warrant issued by the Secretary of Labor, be taken into custody and deported in accordance with the provisions of sections 19 and 20 of the Act of February 5, 1917, entitled *An Act to regulate the immigration of aliens to, and the residence of aliens in, the United States,* or provisions of law hereafter enacted which are amendatory of, or in substitution for, such sections.

"(f) Whenever on trial for a violation of subdivision (c) the defendant is shown to have or to have had possession of the narcotic drug, such possession shall be deemed sufficient evidence to authorize conviction, unless the defendant explains the possession to the satisfaction of the jury.

"(g) The master of any vessel or other water craft, or a person in charge of a railroad car or other vehicle, shall not be liable under subdivision (c) if he satisfies the jury that he had no knowledge of and used due diligence to prevent the presence of the narcotic drug in or on such vessel, water craft, railroad car, or other vehicle; but the narcotic drug shall be seized, forfeited, and disposed of as provided in subdivision (d)."

SECTION 2. That sections 5 and 6 of such Act of February 9, 1909, as amended, are amended to read as follows:

"SECTION 5. That no smoking opium or opium prepared for smoking shall be admitted into the United States or into any territory under its control or jurisdiction for transportation to another country, or be transferred or transshipped from one vessel to another vessel within any waters of the United States for immediate exportation or for any other purpose; and except with the approval of the board, no other narcotic drug may be so admitted, transferred, or transshipped.

"SECTION 6. (a) That it shall be unlawful for any person subject to the jurisdiction of the United States Government to export or cause to be exported from the United States, or from territory under its control or jurisdiction, or from countries in which the United States exercises extraterritorial jurisdiction, any narcotic drug to any other country: *Provided,* That narcotic drugs (except smoking opium and opium prepared for smoking, the exportation of which is hereby absolutely prohibited) may be exported to a country only which has ratified and become a party to the convention and final protocol between the United States Government and other powers for the suppression of the abuses of opium and other drugs, commonly known as the International Opium Convention of 1912, and then only if (1) such country has instituted and maintains, in conformity with that convention, a system, which the board deems adequate, of permits or licenses for the control of imports of such narcotic drugs; (2) the narcotic drug is consigned to an authorized permittee; and (3) there is furnished to the board proof deemed adequate by it, that the narcotic drug is to be applied exclusively to medical and legitimate uses within the country to which exported, that it will not be reexported from such country, and that there is an actual shortage of and a demand for the narcotic drug for medical and legitimate uses within such country.

"(b) The Secretary of State shall request all foreign Governments to communicate through the diplomatic channels copies of the laws and regulations promulgated in their respective countries which prohibit or regulate the importation and shipment in transit of any narcotic drug and, when received, advise the board thereof.

"(c) The board shall make and publish all proper regulations to carry into effect the authority vested in it by this Act."

SECTION 3. That section 8 of such Act of February 9, 1909, as amended, is amended to read as follows:

"SECTION 8. (a) That a narcotic drug that is found upon a vessel arriving at a port of the United States or territory under its control or jurisdiction and is not shown upon the vessel's manifest, or that is landed from any such vessel without a permit first obtained from the collector of customs for that purpose, shall be seized, forfeited, and disposed of in the manner provided in subdivision (d) of section 2, and the master of the vessel shall be liable (1) if the narcotic drug is smoking opium, to a penalty of $25 an ounce, and (2) if any other narcotic drug, to a penalty equal to the value of the narcotic drug.

"(b) Such penalty shall constitute a lien upon the vessel which may be enforced by proceedings by libel in rem. Clearance of the vessel from a port of the United States may be withheld until the penalty is paid, or until there is deposited with the collector of customs at the port, a bond in a penal sum double the amount of the penalty, with sureties approved by the collector, and conditioned on the payment of the penalty (or so much thereof as is not remitted by the Secretary of the Treasury) and of all costs and other expenses to the Government in proceedings for the recovery of the penalty, in case the master's application for remission of the penalty is denied in whole or in part by the Secretary of the Treasury.

"(c) The provision of law for the mitigation and remission of penalties and forfeitures incurred for violations of the customs laws, shall apply to penalties incurred for a violation of the provisions of this section."

SECTION 4. That such Act of February 9, 1909, as amended, is amended by adding at the end thereof a new section to read as follows:

"SECTION 9. That this Act may be cited as the *Narcotic Drugs Import and Export Act.*"

Approved, May 26, 1922.

APPENDIX V

(H. R. 1966)

An Act To amend an Act entitled "An Act to prohibit the importation and use of opium for other than medicinal purposes," approved February ninth, nineteen hundred and nine.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That an Act entitled "An Act to prohibit the importation and use of opium for other than medicinal purposes," approved February ninth, nineteen hundred and nine, is hereby amended so as to read as follows:

"That after the first day of April, nineteen hundred and nine, it shall be unlawful to import into the United States opium in any form or any preparation or derivative thereof: *Provided,* That opium and preparations and derivatives thereof, other than smoking opium or opium prepared for smoking, may be imported for medicinal purposes only, under regulations which the Secretary of the Treasury is hereby authorized to prescribe, and when so imported shall be subject to the duties which are now or may hereafter be imposed by law.

"SECTION 2. That if any person shall fraudulently or knowingly import or bring into the United States, or assist in so doing any opium or any preparation or derivative thereof contrary to law, or shall receive, conceal, buy, sell, or in any manner facilitate the transportation, concealment, or sale of such opium or preparation or derivative thereof after importation, knowing the same to have been imported contrary to law, such opium or preparation or derivative thereof shall be forfeited and shall be destroyed, and the offender shall be fined in any sum not exceeding $5,000 nor less than $50 or by imprisonment for any time not exceeding two years, or both. Whenever, on trial for a violation of this section, the defendant is shown to have, or to have had, possession of such opium or preparation or derivative thereof, such possession shall be deemed sufficient evidence to authorize conviction unless the defendant shall explain the possession to the satisfaction of the jury.

"SECTION 3. That on and after July first, nineteen hundred and thirteen, all smoking opium or opium prepared for smoking found within the United States shall be presumed to have been imported after the first day of April, nineteen hundred and nine, and the burden of proof shall be on the claimant or the accused to rebut such presumption.

"SECTION 4. That any person subject to the jurisdiction of the United States who shall, either as principal or as accessory, receive or have in his possession or conceal on board of or transport on any foreign or domestic vessel or other water craft or railroad car or other vehicle destined to or bound from the United States or any possession thereof, any smoking opium or opium prepared for smoking, or who, having knowledge of the presence in or on any such vessel, water craft, or vehicle of such article, shall not report the same to the principal officer thereof, shall be subject to the penalty provided in section two of this Act. Whenever on trial for violation of this section the defendant is shown to have or to have had possession of such opium, such possession shall be deemed sufficient evidence to authorize conviction, unless the defendant shall explain the possession to the satisfaction of the jury: *Provided, however,* That any master of a vessel or other water craft, or person in charge of a railroad car or other vehicle, shall not be liable under this section if he shall satisfy the jury that he had no knowledge and used due diligence to prevent the presence of such article in or on such vessel, water craft, car, or other vessel, and any such article shall be forfeited and shall be destroyed.

"SECTION 5. That no smoking opium or opium prepared for smoking shall be admitted into the United States, or into any territory under the control or jurisdiction thereof, for transportation to another country, nor shall such opium be transferred or transshipped from one vessel to another vessel within any waters of the United States for immediate exportation or any other purpose.

"SECTION 6. That hereafter it shall be unlawful for any person subject to the jurisdiction of the United States to export or cause to be exported from the United States, or from territory under its control or jurisdiction, or from countries in which the United States exercises extraterritorial jurisdiction, any opium or cocaine, or any salt, derivative, or preparation of opium or cocaine, to any other country: *Provided,* That opium or cocaine, and salts, derivatives, or preparations thereof, except smoking opium or opium prepared for smoking, the exportation of which is hereby absolutely prohibited, may be exported to countries regulating their entry under such regulations as are prescribed by such country for the importation thereof into such country, such regulations to be promulgated from time to time by the Secretary of State of the United States.

"The Secretary of State shall request all foreign Governments to communicate through the diplomatic channels copies of laws and regulations promulgated in their respective countries which prohibit or regulate the importation of the aforesaid drugs, and when received advise the Secretary of the Treasury and the Secretary of Commerce thereof; whereupon the Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce shall make and publish all proper regulations for carrying the provisions of this section into effect.

"SECTION 7. That any person who exports or causes to be exported any of the aforesaid drugs in violation of the preceding section shall be fined in any sum not exceeding $5,000 nor less than $50 or by imprisonment for any time not exceeding two years, or both. And one-half of any fine recovered from any person or persons convicted of an offense under any section of this Act may be paid to the person or persons giving information leading to such recovery, and one-half of any mail forfeited and collected in any proceedings brought under this Act may be paid to the person or persons giving the information which led to the institution of such proceedings, if so directed by the court exercising jurisdiction in the case: *Provided,* That no payment for giving information shall be made to any officer or employee of the United States.

"SECTION 8. That whenever opium or cocaine or any preparations or derivatives thereof shall be found upon any vessel arriving at any port of the United States which is not shown upon the vessel's manifest, as is provided by sections twenty-eight hundred and six and twenty-eight hundred and seven of the Revised Statutes, such vessel shall be liable for the penalty and forfeiture prescribed in section twenty-eight hundred and nine of the Revised Statutes."

TABLE I—DRUGS INCLUDED

STATE	Coca leaves	Cocain	Eucain	Novocain	Synthetic substitute	Yen Shee	Opium	Morphin	Heroin	Codein	Esters	Laudanum	*Cannabis sativa*, "Loco weed"	*Cannabis indica*	Derivatives	Alkaloids or salts	Compounds	Preparations	Mixtures	Manufactures	Chloral Hydrate	*Agara Americana* "Peyote" "Mescal Button" *Anhalonium Lophophora williamsii*
Alabama		+	+				+	+	+							+	+	+				
Arizona		+					+	+										+			+	
Arkansas		+					+	+	+	+		+		+	+		+	+				
California		+	+	+			+	+	+	+			+	+	+	+	+	+			+	+
Colorado	+						+								+	+	+	+		+		+
Connecticut	+	+	+		+		+	+	+	+					+	+	+	+				
Delaware	+	+	+		+		+	+	+	+					+	+	+	+		+	+	
Dist. Columbia		+					+	+								+		+			+	
Florida		+					+	+							+	+	+	+		+		
Georgia		+	+				+	+	+							+	+	+			+	
Idaho		+	+				+	+	+				+	+		+	+	+			+	
Illinois	+						+								+	+	+	+		+		
Indiana		+	+				+	+	+					+	+	+	+	+				
Iowa		+	+				+	+	+					+	+							
Kansas	+						+								+	+	+	+				+
Kentucky		+	+				+								+	+			+			
Louisiana	+		+		+		+	+	+	+					+	+	+	+		+		
Maine		+	+		+		+	+	+	+			+	+		+	+	+				
Maryland		+	+				+	+	+							+	+	+			+	
Massachusetts	+	+	+		+		+	+	+	+			+	+	+	+	+	+				
Michigan	+						+								+	+	+	+		+		
Minnesota	+	+	+		+		+	+	+		+				+	+		+		+	+	
Mississippi		+					+	+							+		+					
Missouri		+					+	+	+	+						+	+					
Montana	+						+								+	+	+	+		+		
Nebraska		+	+				+	+							+	+	+	+				
Nevada		+	+	+		+	+	+	+	+			+		+	+	+	+			+	+
New Hampshire		+			+			+	+	+					+	+		+				
New Jersey		+	+	+			+	+	+	+					+	+	+				+	
New Mexico	+						+							+		+		+				
New York		+	+		+		+	+	+	+	+		+	+	+	+	+	+		+		
North Carolina	+						+								+		+	+				
North Dakota	+	+					+	+	+	+					+	+	+	+		+	+	+
Ohio		+	+		+		+	+	+						+	+	+					
Oklahoma	+						+								+	+	+	+		+		
Oregon		+	+				+	+	+	+				+	+	+	+	+			+	
Pennsylvania	+						+								+		+	+				
Rhode Island		+	+		+		+	+	+	+					+	+	+	+				
South Carolina		+															+		+			
South Dakota	+						+								+	+	+	+		+		
Tennessee	+						+								+	+	+	+		+		
Texas		+					+	+					+	+	+			+			+	
Utah		+	+	+			+	+	+	+			+		+	+	+	+			+	+
Vermont		+					+	+	+	+			+	+		+	+	+				
Virginia		+	+				+	+	+							+	+	+				
Washington	+	+	+				+	+	+	+			+	+	+	+		+	+			
West Virginia		+	+				+	+	+								+	+			+	
Wisconsin		+	+				+	+	+							+	+	+	+			
Wyoming		+	+				+	+	+						+	+	+				+	
Total state laws including named drug	18	37	27	4	10	1	47	36	30	18	2	1	10	13	35	40	40	41	4	13	16	6

TABLE II—EXCEPTIONS

Amount to Ounce Fluid or Solid

STATE	Decocainized coca leaves	Cocain	Eucain	Novocain	Opium	Morphin	Heroin	Codein	Apomorphin	*Cannabis indica* or *sativa* or "Loco weed"	Chloral Hydrate	℞ required for any amount of paregoric	Dover's powder	Diarrhoea and cholera mixture	Liniments and ointments	Liniments and ointments containing cocain, etc., not excepted	Preparations for external use only	Must have other drugs
Alabama		gr.	gr.	gr.	gr. 2	gr. 1/4	gr. 1/8	gr. 1		gr.	gr.				+	+	+	
Arizona					10	1/4	2/3	2			240						+	
Arkansas					2	1/4	1/8	1		1/2					+	+		
California					2	1/4	1/8	1		4	10	+						
Colorado					2	1/4	1/8	1							+	+	+	
Connecticut	+				2	1/4	1/8	1							+	+		
Delaware	+				2	1/4	1/8	1							+	+	+	
Dist. of Columbia		1/4			2	1/4					2		+(20gr.)	+	+		+	
Florida	+				2	1/4	1/8	1							+	+	+	
Georgia			1/8		4	1	1/4				20		+	+	+			
Idaho					0.4%	1/8	1/8				10							
Illinois	+				2	1/4	1/8	1							+	+	+	+
Indiana					2	1/4	1/4	1/4					+				+	
Iowa					2	1/4	1/8	1		1/2					+	+	+	
Kansas	+				2	1/4	1/8	1							+	+	+	
Kentucky					2	1/4	1/4	1/4					+				+	
Louisiana	+				"lawful	quantit	y"										+	
Maine					2	1/2	1/4	1					+	+	+		+	
Maryland					2	2/5	1/4				10			+				
Massachusetts	+				2	1/4	1/8	1									+	
Michigan	+				2	1/4	1/8	1								+	+	
Minnesota	+				2	1/4	1/8	1			120					+	+	
Mississippi					2	1/4	1/8	1							+	+	+	
Missouri					2	1/4	1/8	1								+	+	
Montana	+				2	1/4	1/8	1							+	+	+	
Nebraska					2	1/4	1/8	1							+	+	+	
Nevada			1/6	1/6	2	1/4		1/2		4	10							
New Hampshire					2	1/4	1/8	1										
New Jersey					2	1/4	1/8	1									+	
New Mexico					2					for medicinal purposes only							+	

New York	+				2	1/4	1/8	1	+						+	+	+	
North Carolina	+				2	1/4	1/8	1					+	+	+	+	+	
North Dakota	+				2	1/4	1/8	1							+	+	+	
Ohio	+		1/8		2	1/4	1/4	1									+	
Oklahoma					2	1/4	1/8	1							+	+		
Oregon		1/6	1/6		2	1/4	1/6	1/2		4	10				+			
Pennsylvania	+				2	1/4	1/8	1							+	+	+	
Rhode Island					2	1/4	1/8	1								+		
South Carolina																		
South Dakota	+				2	1/4	1/8	1							+	+	+	
Tennessee					2	1/4	1/8	1							+	+	+	
Texas		1/16			2	1/8				1	2							
Utah					2	1/4	1/8	1		1/2	10				+	+	+	
Vermont					2	1/4	1/8	1		1/2					+	+	+	
Virginia					2	1/3	1/4						+	+	+		+	
Washington					2	1/4	1/8	1							+	+	+	
West Virginia																		
Wisconsin			1/8		2	1/4	1/8	1					+	+			+	
Wyoming																		
	No—33 Yes—16	No— 49 1/4 gr. 1 1/6 1 1/16 1	No— 44 1/6 gr. 2 1/8 3	No— 48 1/6 gr. 1	No— 3 10 gr. 1 4 1 2 42 0.4% 1 "lawful quantity" 1	No— 4 1 gr. 1 1/2 1 2/5 1 1/3 1 1/4 38 1/8 2 "lawful quantity" 1	No— 7 2/3 gr. 1 1/4 7 1/6 1 1/8 32 "lawful quantity" 1	No—10 2 gr. 1 1 33 1/2 2 1/4 2 "lawful quantity" 1	No—48 Yes— 1	No— 39 4 gr. 3 1 1 1/2 4 "for medicinal purposes only" 1 Yes— 1	No— 38 240 gr. 1 120 1 20 1 10 6 2 2	No—48 Yes— 1	No— 41 Yes— 8	No—42 Yes— 7	No—22 Yes—27	No—23 Yes—26	No—15 Yes—34	No—48 Yes— 1

Kentucky—excepts antispasmodics of the National Formulary official at the time of sale.

Maine—excepts preparations containing opium sold in good faith as remedies for neuralgia.

Maryland—excepts laudanum and bona fide proprietaries containing codein.

New York—medical preparations containing *cannabis indica* or *cannabis sativa* when combined with other ingredients in medicinal doses.

North Carolina—paregoric or other preparations containing opium or coca leaves in any quantity cannot be given to children under 12 years of age or to habitual users except on prescription.

Pennsylvania—provides that no preparation containing any opium or coca leaves or any compounds or derivatives thereof in any quantity whatsoever may be sold, dispensed, distributed or given away to or for the use of any known habitual user of drugs or any child of 12 years of age or under except under prescription

Tennessee—excepts Godfrey's Cordial, Bateman's Drops and Castoria.

Texas—excepts corn cures containing preparations of cannabis variety.

Vermont—excepts compound medicinal tablets, pills and powders containing not over 1/20 of a grain of morphin, or ¼ of a grain of codein or any of their salts except heroin to each pill, powder or tablet.

Wyoming—excepts preparations recognized by U. S. P. or N. F. or pharmaceutical preparations to be used in the filling of prescriptions written by a regular practicing physician.

TABLE III—SALE TO CONSUMER

TABLE IV—SALE TO DEALER

	TABLE III—SALE TO CONSUMER						TABLE IV—SALE TO DEALER					
STATE	On ℞ of state licensed physician, dentist or veterinarian	On ℞ of physician, dentist or veterinarian licensed in own state	℞ of physician, etc. Registered under Harrison Act.	Dispensing or administering by physician, etc.	Physician, etc., of good habits. Not intemperate or user of drugs	Prescription of physician	Does not apply to sale to dealer	On official order forms like U. S.	On order of authorized person kept on file two years	Upon official order forms	On order authorized forms to be entered in a book	Same as Harrison Act
Alabama	+						+					
Arizona	+						+					
Arkansas	+*			+*†			+					
California	+						+					
Colorado	+*			+*				+				
Connecticut		+		+					+			
Delaware	+*			+*				+				
Dist.ofColumbia	+						+					
Florida	+*			+*			+					
Georgia	+*			+*			+					
Idaho	+			+†			+					
Illinois			+	+*			+					
Indiana	+			+ (legitimate)			+					
Iowa	+*		+	+*			+					
Kansas			+					+				
Kentucky	+			+			+					
Louisiana	+									+		
Maine		+		+					+			
Maryland					+*		+					
Massachusetts		+*							+			
Michigan	+*			+*					+			
Minnesota	+			+			+					
Mississippi	+						+					
Missouri	+						+					
Montana	+*			+*								
Nebraska	+*			+*			+					
Nevada	+						+					
New Hampshire						+	+					
New Jersey	+*			+*							+	
New Mexico	+											
New York			+	+					+			
North Carolina	+			+					+			
North Dakota	+*			+*			+					
Ohio	+*†			+*†			+					
Oklahoma						+						+
Oregon	+						+					
Pennsylvania	+			+						+		
Rhode Island		+								+		
South Carolina						+	+					
South Dakota	+*			+*			+					
Tennessee	+						+					
Texas	+			+								
Utah	+*						+					
Vermont	+			+							+	
Virginia	+						+					
Washington			+			+	+					
West Virginia	+*				+		+					
Wisconsin	+*		+	+*			+					
Wyoming		+ physicians only					+					
	36	5	6	26	2	4	31	3	6	3	2	1

* In the course of professional practice only.
† In personal attendance.

Table III—*Sale to Consumer* (additional provisions)

Alabama—except in the case of addicts and then only for treatment.
Connecticut—except in the case of addicts unless "drug is obviously needed for therapeutic purposes."
District of Columbia—except in the case of addicts and then only for treatment.
Florida—except in the case of addicts and then only for treatment.
Georgia—except in the case of addicts unless in good faith for user under professional care.
Illinois—except in the case of addicts and then only for treatment.
Indiana—except that no physician may prescribe for an addict.
Maine—except in the case of addicts unless under professional care.
Massachusetts—except in the case of addicts and then only for treatment.
Minnesota—except in the case of addicts unless physician can show necessity to save life.
Nebraska—except in the case of addicts and then only on personal administration.
Nevada—except in the case of addicts and then only for treatment.
North Dakota—except in the case of addicts and then only for treatment.
Oklahoma—except in the case of addicts and then only for treatment. Only one dose to a prescription.
Pennsylvania—except in the case of addicts and then only for treatment.
Texas—except in the case of addicts and then only for treatment.[1]
Utah—except in the case of addicts and then only for treatment.[1] The use of anhalonium or peyote in any form is prohibited.
Virginia—except in the case of addicts and then only for treatment.
West Virginia—except in the case of addicts and then only for treatment.
Wisconsin—except in the case of addicts and then only for treatment.

---

[1] In the course of professional practice only.

TABLE V—RECORD BY PHARMACISTS

TABLE VI—RECORD BY PHYSICIANS

STATE	Order or prescription to be kept on file	Record kept on file	Record to be kept for two years on forms supplied by State Bd. of Health	Record to be kept except when in personal attendance	Record same as in Harrison Act
Alabama	2 years	+ exempt only 2 years			
Arizona	5 years	5 years			
Arkansas	+	+			
California	℞ permanently Orders 2 years				
Colorado	2 years			2 years	
Connecticut	2 years	+			
Delaware	2 years			+	
Dist Columbia	3 years				
Florida					
Georgia	permanently				
Idaho	1 year				
Illinois	2 years			2 years	
Indiana	permanently				
Iowa					
Kansas					
Kentucky	+				
Louisiana	2 years		+		
Maine	2 years				
Maryland	permanently				
Massachusetts	2 years	2 years			
Michigan	2 years				
Minnesota	2 years	+			
Mississippi					
Missouri					
Montana	2 years			2 years	
Nebraska	2 years	(addicts only) 2 years			
Nevada	3 years				
New Hampshire	2 years				
New Jersey	5 years				
New Mexico					
New York	2 years			2 years*	
North Carolina	permanently	+			
North Dakota	2 years	2 years			
Ohio	2 years				
Oklahoma	+				+
Oregon	permanently				
Pennsylvania	2 years	+			
Rhode Island	5 years	2 years			
South Carolina					
South Dakota	2 years				+
Tennessee					
Texas	permanently				
Utah	permanently				
Vermont	2 years	of dispensing only +			
Virginia					
Washington	2 years				
West Virginia	permanently				
Wisconsin	2 years			+	
Wyoming	+				
	On file 4	On file 5	1	2	2
	Permanently 8	5 years 1		2 years 4	
	℞ permanently 1	2 years 3			
	Order 2 years	Addicts only			
	5 years 3	2 years 1			
	3 years 2	Of dispensing only 1			
	2 years 21	Exempt only			
	1 year 1	2 years 1			

* New York—does not apply to *cannabis indica* and *cannabis sativa* except for manufacturers and wholesalers.

TABLE VII—POSSESSION		TABLE VIII—SMOKING OPIUM
STATE	Violation	Prohibited
Alabama		
Arizona		
Arkansas	+	
California	+	+ also smoking hemp or pipes or contrivances.
Colorado	+	
Connecticut	+	
Delaware	+	
Dist. of Columbia		
Florida		+
Georgia		
Idaho	+	
Illinois		
Indiana		
Iowa	+	Nuisance to maintain place where habitual users resort for purposes of using drug or for illegal keeping of same.
Kansas	+	
Kentucky		
Louisiana	+	
Maine	+	
Maryland	+	+
Massachusetts	+	+
Michigan	+	
Minnesota	+	
Mississippi	+	
Missouri		
Montana	+	
Nebraska		
Nevada		
New Hampshire		
New Jersey	+	
New Mexico		+
New York	+	
North Carolina	+	
North Dakota	+	Nuisance to maintain place where habitual users resort for purposes of using drug or for illegal keeping of same.
Ohio	+	+
Oklahoma	+	+
Oregon	+	
Pennsylvania	+	
Rhode Island	+	+
South Carolina	+	
South Dakota	+	
Tennessee	+	
Texas		
Utah	+	+
Vermont		
Virginia	+*	
Washington	+	
West Virginia	+	
Wisconsin	+	Also smoking hemp or pipe or contrivances. Keeping of place for purpose of using drug or illegal keeping of drug for sale is common nuisance.
Wyoming	+	+
	34	10 See laws of California, Iowa, N. Dakota and Wisconsin.

---

* Virginia—cocain and eucain only.

TABLE IX—RESTRICTIONS SURROUNDING PHYSICIANS

STATE	Not to habitual user except for treatment in good faith	Not over 3 weeks without consultation with other physicians of Board of Health—Reports of cases	Not to himself—to user in treatment—limits daily amount for 15 to 30 days—Report cases	May to users in course of professional practice. Keep records 2 years—physicians, if users, may have their licenses revoked	May use drugs in good faith for medicinal purposes only	To users in reducing doses for treatment report cases not acting in good faith. Users who are incurable can have drug—examined by county judge and agent S.B.H.	May give drugs to cases under immediate care or treatment only	Not to user. May legitimately administer said drugs	Not to user. Personal administration advertised cures, etc. (See law)	Report cases in 48 hours. Treat for thirty days	May give to user after consultation personally administered. (See law)	Only in the legitimate and necessary practice of medicine	To users for treatment in good faith. Report to State Board of Health. (See law)	Personally administer or dispense (See law)	Only when beneficial to patient. (See law)
Alabama	+														
Arizona		+													
Arkansas												+		+	
California			+												
Colorado				+											
Connecticut	+														
Delaware					+										
Dist. of Columbia	+														
Florida						+									
Georgia	+														
Idaho							+								
Illinois	+ and keep record														
Indiana								+							
Iowa															
Kansas															
Kentucky															
Louisiana	+ and in reducing doses with "due control"														
Maine	+														
Maryland	+														
Massachusetts									+						
Michigan															
Minnesota	+ in order to save his life														
Mississippi															
Missouri															
Montana										+					
Nebraska											+				
Nevada	+														
New Hampshire															
New Jersey												+			
New Mexico															
New York					+		+								
North Carolina					+										
North Dakota	+ and keep on record														
Ohio												+		+	
Oklahoma	+														
Oregon															
Pennsylvania													+		
Rhode Island														+	
South Carolina															
South Dakota												+		+	+
Tennessee															
Texas	+						+								
Utah	+						+								
Vermont															
Virginia	+						+								
Washington													+		
West Virginia	+						+								
Wisconsin	+				+		+ (see law)								
Wyoming															
	13	1	1	1	4	1	6 Wisconsin (see law)	1	1	1	1	4	2	4	1
and keep record	2														
and in reducing doses with "due control"	1														
in order to save his life	1														

New York—only after physical examination of patient.

North Carolina—only for treatment of some malady other than addiction after physical examination. Must report case to County Health Officer or State Board of Health.

TABLE X—PROVISION FOR ADDICTS

TABLE XI—REGISTRATION OF ADDICTS

STATE	Committed to city, county or state hospital or institution by order of the court	Committed to insane hospital	Treated by physician under restriction	
Alabama........				
Arizona.........				By physician treating
Arkansas........				
California.......			+	
Colorado........	+			
Connecticut.....		+ also admission on voluntary application		
Delaware........	+			
Dist. of Columbia				
Florida.........		+		
Georgia.........				
Idaho...........				
Illinois..........				
Indiana.........				
Iowa...........				
Kansas.........				
Kentucky.......		+ voluntary		
Louisiana.......	+ and licensed private hospital			
Maine..........				
Maryland.......				
Massachusetts...				
Michigan........				
Minnesota.......	+		+	
Mississippi......				
Missouri........				
Montana........	+			Physicians report to county attorney
Nebraska........				
Nevada.........		+		
New Hampshire.				
New Jersey......				
New Mexico.....				
New York.......	+ also voluntary commitment*			
North Carolina...				+*
North Dakota...				
Ohio...........	+ "a hospital"			
Oklahoma.......				
Orgeon.........	(see law)			
Pennsylvania....	+ "or asylum"			By physician
Rhode Island....	State Board of Health empowered to make regulations as to treatment of addicts			
South Carolina...				
South Dakota....				
Tennessee.......				
Texas...........				
Utah...........				
Vermont........				
Virginia.........				
Washington.....	+ (see law)			
West Virginia....				
Wisconsin.......	+ also voluntary commitment*			
Wyoming.......				

* New York—if such institution is willing to receive such addict.

* North Carolina—annual reporting to State Board of Health of addicts treated in public state or county institutions except state hospitals at Raleigh.

* Wisconsin—counties containing cities of the first class shall make provision for the treatment of addicts in local institutions.

STATE	TABLE XII—DEFINITION OF ADDICT	TABLE XIII—LAW ENFORCED BY
Alabama		Board of Pharmacy
Arizona		Pharmacy and Attorney
Arkansas		County Attorney
California		Pharmacy
Colorado		State Board of Health and Food Commissioner
Connecticut		Commissioner of Pharmacy
Delaware		State Board of Health
Dist. of Columbia		Superintendent of Police
Florida		State Board of Health
Georgia		Board of Pharmacy
Idaho		County Attorney
Illinois		Department of Registration and Education
Indiana		Pharmacy
Iowa		Peace Officer and County Attorney
Kansas		Board of Pharmacy
Kentucky		Board of Pharmacy
Louisiana		State Board of Health
Maine		Board of Pharmacy and State Board of Health
Maryland		Board of Health
Massachusetts		State Board of Health
Michigan		Board of Pharmacy
Minnesota		
Mississippi		Justice of the Peace
Missouri		
Montana	See law	State Board of Health and Internal Revenue Agents
Nebraska		
Nevada		Pharmacy and District Attorney and Officials in charge of food and drug work in state
New Hampshire		State Board of Health
New Jersey		
New Mexico		Board of Pharmacy
New York		
North Carolina		Board of Pharmacy
North Dakota		
Ohio		Secretary of Agriculture
Oklahoma		
Oregon		Board of Pharmacy
Pennsylvania		State Board of Health
Rhode Island		State Board of Health
South Carolina		State Board of Health
South Dakota		State Food and Drug Department
Tennessee		Department of Foods, Fertilizers and Dairies
Texas		Dairy and Food Commissioner
Utah		
Vermont		State Board of Health
Virginia		
Washington	See law	State and local boards of health
West Virginia		
Wisconsin		Board of Pharmacy, Police and Sheriffs
Wyoming		
	Not defined 47 See law 2	

TABLE XIV—PENALTIES FOR VIOLATIONS

STATE	
Alabama	Misdemeanor, fine.
Arizona	Misdemeanor. Not less than $100 or imprisonment or both, 1st. Not less than $250, 2nd. 1 year 3rd.
Arkansas	Imprisonment not less than 6 months.
California	Illegal selling—first offense, imprisonment not less than 6 months or more than 6 years, second offense imprisonment not less than 1 year or more than 10 years. Illegal possession—first offense, imprisonment not more than 6 years, second offense imprisonment not more than 10 years. Employment of minor in unlawful trade—felony, imprisonment not less than 1 year or more than 5 years, each subsequent offense imprisonment not less than 6 years. Forging prescription—first offense, imprisonment not less than 6 months or more than 6 years, second offense, imprisonment not less than 1 year or more than 10 years.
Colorado	Misdemeanor. Not less than $100 or imprisonment not less than 30 days or both, afterward a felony.
Connecticut	Fine or imprisonment or both.
Delaware	Misdemeanor. Fine or imprisonment or both. Physician, etc., license revoked.
Dist. of Columbia	Misdemeanor. Fine or imprisonment or both.
Florida	Felony, imprisonment not less than 1 year or more than 5 years.
Georgia	Misdemeanor. See law.
Idaho	Unlawful traffic—felony, imprisonment not less than 2 or more than 10 years. Unlawful procuring—misdemeanor, fine not less than $100 or more than $250, or imprisonment not more than 6 months, or both. Violation by licensed professionals—fine not exceeding $250 and permanent revocation of license.
Illinois	Misdemeanor. Fine or imprisonment or both, 1st. Fine not less than $200 or imprisonment not less than 3 months or both. Physician or pharmacist may have license suspended or revoked.
Indiana	Misdemeanor. Not less that $25 and imprisonment not less than 90 days or both, 1st Felony. Not less than $200 and imprisonment not less than 1 year, 2nd. Revocation of license.
Iowa	Misdemeanor, imprisonment not more than 10 years, or fine not exceeding $1,000, or both. License revoked if addicted.
Kansas	Fine not less than $500 and imprisonment 1 year, maximum fine $5,000 and imprisonment 7 years.
Kentucky	Fine not less than $100 or jail not less than 30 days or both, 1st. Imprisonment not less than 1 year and revocation of license, 2nd.
Louisiana	Misdemeanor. Revocation of license if addicted or on conviction.
Maine	Fine not less than $50 or imprisonment or both.
Maryland	Misdemeanor. For possession, fine or imprisonment for not less than 1 year for furnishing or prescribing. Fine not less than $25 and imprisonment at discretion of court.
Massachusetts	Fine or imprisonment or both.
Michigan	Felony. Fine, imprisonment or both.
Minnesota	Felony. Not less than 1 year imprisonment, fine or both. Revocation of license, 2nd conviction. If twice convicted within 5 years, imprisonment not exceeding 3 years.
Mississippi	Not less than 1 year or more than 10 years.
Missouri	Not less than $10, 1st. Fine not less than $50 or imprisonment or both, 2nd.
Montana	Illegal possession—fine not less than $500 or more than $3,000, and imprisonment not less than 1 year or more than 5 years. Illegal distribution—to person over 18 years of age, fine not less than $1,000 or more than $3,000 and imprisonment not less than 5 years or more than 10 years. Illegal distribution—to person 18 years or under—imprisonment not less than 5 years or "more than life."
Nebraska	Felony. Fine or imprisonment.
Nevada	Fine not less than $100 or imprisonment not less than 100 days or both, 1st. Fine not less than $250 or imprisonment not more than 200 days or both, 2nd. Imprisonment not less than 1 year, 3rd.
New Hampshire	Fine or imprisonment or both.
New Jersey	High misdemeanor.
New Mexico	Misdemeanor. Fine or imprisonment or both. As to cannabis indica, imprisonment not less than 1 year, 1st. Imprisonment not less than 3 years, 2nd.
New York	Misdemeanor.
North Carolina	Misdemeanor. Fine or imprisonment.
North Dakota	Not less than $100 or imprisonment or both.
Ohio	Fine or imprisonment or both.
Oklahoma	Felony. Not less than $500 or imprisonment or both. Conviction permanently revokes license.

TABLE XIV—PENALTIES FOR VIOLATIONS—*Continued*

STATE	
Oregon	Felony. Not less than $200 and imprisonment not less than 1 year. Possession not less than $100 and imprisonment.
Pennsylvania	Misdemeanor. Fine or imprisonment or both. Burden of proof on defendant. Revocation of license if addicted or convicted.
Rhode Island	Fine, imprisonment or both.
South Carolina	Misdemeanor. Fine, imprisonment or both.
South Dakota	Misdemeanor. Fine, not less than $50 or imprisonment, 1st. Fine not less than $500 or imprisonment or both. Revocation of license for not less than 1 year, 2nd.
Tennessee	Felony, not less than $100 and imprisonment not less than 3 years. Burden of proof on defendant as to exemption.
Texas	Misdemeanor. Fine or imprisonment or both.
Utah	Misdemeanor. Fine or imprisonment or both.
Vermont	Fine or imprisonment or both.
Virginia	Misdemeanor, first offense fine not exceeding $100, second offense, fine not less than $200 or more than $1,000, or imprisonment 6 months, or both.
Washington	Felony. Imprisonment not less than 1 year or more than 10 years. Revocation of license 10 years.
West Virginia	Illegal possession—felony, confinement not less than 1 or more than 10 years. Unlawful filling of prescriptions—misdemeanor, fine not less than $25 or more than $200, and confinement not exceeding 6 months, in the discretion of the court.
Wisconsin	Felony, fine of not less than $100 or more than $1,000, or imprisonment not less than 1 year or more than 5 years. Revocation of license.
Wyoming	Felony. Fine not less than $500 or imprisonment of not less than 1 year or both.

TABLE XV—REMARKS

STATE	
Alabama	
Arizona	
Arkansas	See "Remarks" in abstract of laws
California	See "Remarks" in abstract of laws
Colorado	
Connecticut	Addicted physician, etc., incapable performing duties license revoked
Delaware	Hypodermic unlawful, see law. Addicted physician license revoked
Dist. of Columbia	
Florida	
Georgia	
Idaho	
Illinois	
Indiana	
Iowa	
Kansas	
Kentucky	
Louisiana	Unauthorized persons may not possess hypodermic or needle
Maine	
Maryland	
Massachusetts	Possession of hypodermic or needle unlawful. (See law)
Michigan	
Minnesota	
Mississippi	State not confined in proof to single violation but accused not again liable to prosecution for offence committed anterior to indictment
Missouri	
Montana	"Good faith" defined (see law)
Nebraska	
Nevada	
New Hampshire	
New Jersey	
New Mexico	
New York	Possession of hypodermic needle unlawful (see law)
North Carolina	
North Dakota	
Ohio	
Oklahoma	
Oregon	
Pennsylvania	
Rhode Island	Hypodermic unlawful, no exception (see law)
South Carolina	
South Dakota	
Tennessee	
Texas	Felony to carry pistol, other weapon or arms while possessing for unlawful disposition proscribed drugs. Penalty, imprisonment not less than one year
Utah	
Vermont	
Virginia	
Washington	Addict in quarantine, right of appeal Addict in quarantine deeming self cured, right of appeal
West Virginia	
Wisconsin	Possession hypodermic or needle unlawful (see law)
Wyoming	

APPENDIX VII

(H. R. 1967)

An Act Regulating the manufacture of smoking opium within the United States, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That an internal-revenue tax of $300 per pound shall be levied and collected upon all opium manufactured in the United States for smoking purposes; and no person shall engage in such manufacture who is not a citizen of the United States and who has not given the bond required by the Commissioner of Internal Revenue. Every person who prepares opium suitable for smoking purposes from crude gum opium, or from any preparation thereof, or from the residue of smoked or partially smoked opium, commonly known as yen shee, or from any mixture of the above, or any of them, shall be regarded as a manufacturer of smoking opium within the meaning of this Act.

SECTION 2. That every manufacturer of such opium shall file with the collector of internal revenue of the district in which his manufactory is located such notices, inventories, and bonds, shall keep such books and render such returns of material and products, shall put up such signs and affix such number to his factory, and conduct his business under such surveillance of officers and agents as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulation require. But the bond required of such manufacturer shall be with sureties satisfactory to the collector of internal revenue, and in a penal sum of not less than $100,000; and the sum of said bond may be increased from time to time and additional sureties required, at the discretion of the collector or under instructions of the Commissioner of Internal Revenue.

SECTION 3. That all opium prepared for smoking manufactured in the United States shall be duly stamped in such a permanent manner as to denote the payment of the internal-revenue tax thereon.

SECTION 4. That the provisions of existing laws covering the engraving, issue, sale, accountability, effacement, cancellation, and the destruction of stamps relating to tobacco and snuff, as far as applicable, are hereby made to apply to stamps provided for by the preceding section.

SECTION 5. That a penalty of not less than $10,000 or imprisonment for not less than five years, or both, in the discretion of the court, shall be imposed for each and every violation of the preceding sections of this Act relating to opium by any person or persons; and all opium prepared for smoking wherever found within the United States without the stamps required by this Act shall be forfeited and destroyed.

SECTION 6. The provisions of the Act of October first, eighteen hundred and ninety (Twenty-sixth Statutes, page fifteen hundred and sixty-seven), in so far as they relate to the manufacture of smoking opium, are hereby repealed.

Approved, January 17, 1914.

APPENDIX VIII

Act of December 17, 1914, as amended by sections 1006-1008, Revenue Act of 1918, sections 703 and 704, Revenue Act of 1926, and the act of January 22, 1927.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

SECTION 1. That on or before July 1 of each year every person who imports, manufactures, produces, compounds, sells, deals in, dispenses, or gives away opium or coca leaves, or any compound, manufacture, salt, derivative or preparation thereof, shall register with the collector of internal revenue of the district his name or style, place of business and place or places where such business is to be carried on, and pay the special taxes hereinafter provided:

Every person who on January 1, 1919, is engaged in any of the activities above enumerated, or who between such date and the passage of this Act first engages in any of such activities, shall within 30 days after the passage of this Act make like registration and shall pay the proportionate part of the tax for the period ending June 30, 1919; and

Every person who first engages in any such activities after the passage of this Act shall immediately make like registration and pay the proportionate part of the tax for the period ending on the following June 30th;

Importers, manufacturers, producers, or compounders $24 per annum; wholesale dealers, $12 per annum; retail dealers, $6 per annum; physicians, dentists, veterinary surgeons, and other practitioners lawfully entitled to distribute, dispense, give away, or administer any of the aforesaid drugs to patients upon whom they in the course of their professional practice are in attendance, shall pay $3 per annum.

Every person who imports, manufactures, compounds, or otherwise produces for sale or distribution any of the aforesaid drugs shall be deemed to be an importer, manufacturer, or producer.

Every person who sells or offers for sale any of said drugs in the original stamped packages, as hereinafter provided, shall be deemed a wholesale dealer.

Every person who sells or dispenses from original stamped packages, as hereinafter provided, shall be deemed a retail dealer: *Provided,* That the office, or if none, the residence, of any person shall be considered for the purpose of this Act his place of business; but no employee of any person who has registered and paid special tax as herein required, acting within the scope of his employment, shall be required to register and pay special tax provided by this section: *Provided further,* That officials of the United States, Territorial, District of Columbia, or insular possessions, State or municipal governments, who in the exercise of their official duties engage in any of the businesses herein described, shall not be required to register, nor pay special tax, nor stamp the aforesaid drugs as hereinafter prescribed, but their right to this exemption shall be evidenced in such manner as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulations prescribe.

It shall be unlawful for any person required to register under the provisions of this Act to import, manufacture, produce, compound, sell, deal in, dispense, distribute, administer, or give away any of the aforesaid drugs without having registered and paid the special tax as imposed by this section.

That the word "person" as used in this Act shall be constructed to mean and include a partnership, association, company, or corporation, as well as a natural person; and all provisions of existing law relating to special taxes, as far as necessary, are hereby extended and made applicable to this section.

That there shall be levied, assessed, collected, and paid upon opium, coca leaves, any compound, salt, derivative, or preparation thereof, produced in or imported into the United States, and sold, or removed for consumption or sale, an internal-revenue tax at the rate of 1 cent per ounce, and any fraction of an ounce in a package shall be taxed as an ounce, such tax to be paid by the importer, manufacturer, producer, or compounder thereof, and to be represented by appropriate stamps, to be provided by the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury; and the stamps herein provided shall be so affixed to the bottle or other container as to securely seal the stopper, covering, or wrapper thereof.

The tax imposed by this section shall be in addition to any import duty imposed on the aforesaid drugs.

It shall be unlawful for any person to purchase, sell, dispense, or distribute any of the aforesaid drugs except in the original stamped package or from the original stamped package; and the absence of appropriate tax-paid stamps from any of the aforesaid drugs shall be prima facie evidence of a violation of this section by the person in whose possession same may be found; and the possession of any original stamped package containing any of the aforesaid drugs by any person who has not registered and paid special taxes as required by this section shall be prima facie evidence of liability to such special tax: *Provided,* That the provisions of this paragraph shall not apply to any person having in his or her possession any of the aforesaid drugs which have been obtained from a registered dealer in pursuance of a prescription, written for legitimate medical uses, issued by a physician, dentist, veterinary surgeon, or other practitioner registered under this Act; and where the bottle or other container in which such drug may be put up by the dealer upon said prescription bears the name and registry number of the druggist, serial number of prescription, name and address of the patient, and name, address and registry number of the person writing said prescription; or to the dispensing, or administration, or giving away of any of the aforesaid drugs to a patient by a registered physician, dentist, veterinary surgeon, or other practitioner in the course of his professional practice, and where said drugs are dispensed or administered to the patient for legitimate medical purposes, and the record kept as required by this Act of the drugs so dispensed, administered, distributed, or given away.

And all the provisions of existing laws relating to the engraving, issuance, sale, accountability, cancellation, and destruction of tax-paid stamps provided for in the internal-revenue laws are, in so far as necessary, hereby extended and made to apply to stamps provided by this section.

That all unstamped packages of the aforesaid drugs found in the possession of any person, except as herein provided, shall be subject to seizure and forfeiture, and all the provisions of existing internal revenue laws relating to searches, seizures, and forfeitures of unstamped articles are hereby extended to and made to apply to the articles taxed under this Act and the persons upon whom these taxes are imposed.

Importers, manufacturers, and wholesale dealers shall keep such books and records and render such monthly returns in relation to the transactions in the aforesaid drugs as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may by regulations require.

The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall make all needful rules and regulations for carrying the provisions of this Act into effect.

SECTION 2. That it shall be unlawful for any person to sell, barter, exchange, or give away any of the aforesaid drugs except in pursuance of a written order of the person to whom such article is sold, bartered, exchanged, or given, on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue. Every person who shall accept any such order, and in pursuance thereof shall sell, barter, exchange, or give away any of the aforesaid drugs, shall preserve such order for a period of two years in such a way as to be readily accessible to inspection by any officer, agent, or employee of the Treasury Department duly authorized for that purpose, and the State, Territorial, District, municipal, and insular officials named in section 5 of this Act. Every person who shall give an order as herein provided to any other person for any of the aforesaid drugs shall, at or before the time of giving such order, make or cause to be made a duplicate thereof on a form to be issued in blank for that purpose by the Commissioner of Internal Revenue, and in case of the acceptance of such order, shall preserve such duplicate for said period of two years in such a way as to be readily accessible to inspection by the officers, agents, employees, and officials hereinbefore mentioned. Nothing contained in this section shall apply—

(a) To the dispensing or distribution of any of the aforesaid drugs to a patient by a physician, dentist, or veterinary surgeon registered under this Act in the course of his professional practice only: *Provided,* That such physician, dentist, or veterinary surgeon shall keep a record of all such drugs dispensed or distributed, showing the amount dispensed or distributed, the date, and the name and address of the patient to whom such drugs are dispensed or distributed, except such as may be dispensed or distributed to a patient upon whom such physician, dentist or veterinary surgeon shall personally attend; and such record shall be kept for a period of two years from the date of dispensing or distributing such drugs, subject to inspection, as provided in this Act.

(b) To the sale, dispensing, or distribution of any of the aforesaid drugs by a dealer to a consumer under and in pursuance of a written prescription issued by a physician, dentist, or veterinary surgeon registered under this Act: *Provided, however,* That such prescription shall be dated as of the day on which signed and shall be signed by the physician, dentist, or veterinary surgeon who shall have issued the same: *And provided further,* That such dealer shall preserve such prescription for a period of two years from the day on which such prescription is filled in such a way as to be readily accessible to inspection by the officers, agents, employees, and officials hereinbefore mentioned.

(c) To the sale, exportation, shipment or delivery of any of the aforesaid drugs by any person within the United States or any Territory or the District of Columbia or any of the insular possessions of the United States to any person in any foreign country, regulating their entry in accordance with such regulations for importation therof into such foreign country as are prescribed by said country, such regulations to be promulgated from time to time by the Secretary of State of the United States.

(d) To the sale, barter, exchange, or giving away of any of the aforesaid drugs to any officer of the United States Government or of any State, territorial, district, county, or municipal or insular government lawfully engaged in making purchases thereof for the various departments of the Army and Navy, the Public Health Service, and for Government, State, territorial district, county, or municipal or insular hospitals or prisons.

The Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall cause suitable forms to be prepared for the purposes above mentioned, and shall cause the same to be distributed to collectors of internal revenue for sale by them to those persons who shall have registered and paid the special tax as required by section one of this Act in their districts respectively; and no collector shall sell any of such forms to any persons other than a person who has registered and paid the special tax as required by section one of this Act in his district. The price at which such forms shall be sold by said collectors shall be fixed by the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, but shall not exceed the sum of $1 per hundred. Every collector shall keep an account of the number of such forms sold by him, the names of the purchasers, and the number of such forms sold to each of such purchasers. Whenever any collector shall sell any of such forms, he shall cause the name of the purchaser thereof to be plainly written or stamped thereon before delivering the same; and no person other than such purchaser shall use any of said forms bearing the name of such purchaser for the purpose of procuring any of the aforesaid drugs, or furnish any of the forms bearing the name of such purchaser to any person with intent thereby to procure the shipment or delivery of any of the aforesaid drugs. It shall be unlawful for any person to obtain by means of said order forms any of the aforesaid drugs for any purpose other than the use, sale, or distribution thereof by him in the conduct of a lawful business in said drugs or in the legitimate practice of his profession.

The provisions of this Act shall apply to the United States, the District of Columbia, the Territory of Alaska, the Territory of Hawaii, the insular possessions of the United States, and the Canal Zone. In Porto Rico and the Philippine Islands the administration of this Act, the collection of the said special tax, and the issuance of the order forms specified in section two shall be performed by the appropriate internal-revenue officers of those governments, and all revenues collected hereunder in Porto Rico and the Philippine Islands shall accrue intact to the general governments thereof, respectively. The courts of first instance in the Philippine Islands shall possess and exercise jurisdiction in all cases arising under this Act in said islands. The President is authorized and directed to issue such Executive orders as will carry into effect in the Canal Zone the intent and purpose of this Act by providing for the registration and the imposition of a special tax upon all persons in the Canal Zone who produce, import, compound, deal in, dispense, sell, distribute, or give away opium or coca leaves, their salts, derivatives, or preparations.

SECTION 3. That any person who shall be registered in any internal revenue district under the provisions of section one of this Act, shall whenever required so to do by the collector of the district, render to the said collector a true and correct statement or return, verified by affidavit, setting forth the quantity of the aforesaid drugs received by him in said internal-revenue district during such period immediately preceding the demand of the collector, not exceeding three months, as the said collector may fix and determine; the names of the persons from whom the said drugs were received; the quantity in each instance received from each of such persons, and the date when received.

SECTION 4. That it shall be unlawful for any person who shall not have registered and paid the special tax as required by section one of this Act to send, ship, carry, or deliver any of the aforesaid drugs from any State or Territory or the District of Columbia, or any insular possession of the United States, to any person in any other State or Territory or the District of Columbia or any insular possession of the United States: *Provided,* That nothing contained in this section shall apply to common carriers engaged in transporting the aforesaid drugs, or to any employee acting within the scope of his employment, of any person who shall have registered and paid the special tax as required by section one of this Act, or to any person who shall deliver any such drug which has been prescribed or dispensed by a physician, dentist, or veterinarian required to register under the terms of this Act, who has been employed to prescribe for the particular patient receiving such drug, or to any United States, State, county, municipal, District, Territorial, or insular officer or official acting within the scope of his official duties.

SECTION 5. That the duplicate order forms and the prescriptions required to be preserved under the provisions of section two of this Act, and the statements or returns filed in the office of the collector of the district, under the provisions of section three of this Act, shall be open to inspection by officers, agents, and employees of the Treasury Department duly authorized for that purpose; and such officials of any State or Territory, or of any organized municipality therein, or of the District of Columbia, or any insular possession of the United States, as shall be charged with the enforcement of any law or municipal ordinance regulating the sale, prescribing, dispensing, dealing in, or distribution of the aforesaid drugs. Each collector of internal revenue is hereby authorized to furnish, upon written request, certified copies of any of the said statements or returns filed in his office to any of such officials of any State or

Territory or organized municipality therein, or the District of Columbia, or any insular possession of the United States, as shall be entitled to inspect the said statements or returns filed in the office of the said collector, upon the payment of a fee of $1 for each one hundred words or fraction thereof in the copy or copies so requested. Any person who shall disclose the information contained in the said statements or returns or in the said duplicate order forms, except as herein expressly provided, and except for the purpose of enforcing the provisions of this Act, or for the purpose of enforcing any law of any State or Territory or the District of Columbia, or any insular possessions of the United States, or ordinance of any organized municipality therein, regulating the sale, prescribing, dispensing, dealing in, or distribution of the aforesaid drugs, shall, on conviction, be fined or imprisoned as provided by section nine of this Act. And collectors of internal revenue are hereby authorized to furnish upon written request, to any person, a certified copy of the names of any or all persons who may be listed in their respective collection districts as special taxpayers under the provisions of this Act, upon payment of a fee of $1 for each one hundred names or fraction thereof in the copy so requested.

SECTION 6. That the provisions of this Act shall not be construed to apply to the manufacture, sale, distribution, giving away, dispensing, or possession of preparations and remedies which do not contain more than two grains of opium, or more than one-fourth of a grain of morphine, or more than one-eighth of a grain of heroin, or more than one grain of codein, or any salt, or derivative of any of them in one fluid ounce; or, if a solid or semi-solid preparation, in one avoirdupois ounce; or, to liniments, ointments, or other preparations which are prepared for external use, only, except liniments, ointments, and other preparations which contain cocaine or any of its salts or alpha or beta eucaine or any of their salts or any synthetic substitute for them: *Provided,* That such remedies and preparations are manufactured, sold, distributed, given away. dispensed, or possessed as medicines and not for the purpose of evading the intentions and provisions of this Act: *Provided further,* That any manufacturer, producer, compounder, or vendor (including dispensing physicians) of the preparations and remedies mentioned in this section shall keep a record of all sales, exchanges, or gifts of such preparations and remedies in such manner as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, shall direct. Such record shall be preserved for a period of two years in such a way as to be readily accessible to inspection by any officer, agent or employee of the Treasury Department duly authorized for that purpose, and the State, Territorial, District, municipal, and insular officers named in section 5 of this Act, and every such person so possessing or disposing of such preparations and remedies shall register as required in section 1 of this Act, and, if he is not paying a tax under this Act, he shall pay a special tax of $1 for each year, or fractional part thereof, in which he is engaged in such occupation, to the collector of internal revenue of the district in which he carries on such occupation as provided in this Act. The provisions of this Act as amended shall not apply to decocainized coca leaves or preparations made therefrom, or to other preparations of coca leaves which do not contain cocaine.

SECTION 7. That all laws relating to the assessment, collection, remission, and refund of internal-revenue taxes including section thirty-two hundred and twenty-nine of the Revised Statutes of the United States, so far as applicable to and not inconsistent with the provisions of this Act, are hereby extended and made applicable to the special taxes imposed by this Act.

SECTION 8. That it shall be unlawful for any person not registered under the provisions of this Act, and who has not paid the special tax provided for by this Act, to have in his possession or under his control any of the aforesaid drugs; and such possession or control shall be presumptive evidence of a violation of this section, and also of a violation of the provisions of section one of this Act: *Provided*, That this section shall not apply to any employee of a registered person, or to a nurse under the supervision of a physician, dentist, or veterinary surgeon registered under this Act, having such possession or control by virtue of his employment or occupation and not on his own account; or to the possession of any of the aforesaid drugs which has or have been prescribed in good faith by a physician, dentist, or veterinary surgeon registered under this Act; or to any United States, State, county, municipal, District, Territorial, or insular officer or official who has possession of any said drugs, by reason of his official duties, or to a warehouseman holding possession for a person registered and who has paid the taxes under this Act; or to common carriers engaged in transporting such drugs; *Provided further,* That it shall not be necessary to negative any of the aforesaid exemptions in any complaint, information, indictment, or other writ or proceeding laid or brought under this Act; and the burden of proof of any such exemption shall be upon the defendant.

SECTION 9. That any person who violates or fails to comply with any of the requirements of this Act shall, on conviction, be fined not more than $2,000 or be imprisoned not more than five years, or both, in the discretion of the court.

SECTION 10. That the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, is authorized to appoint such agents, deputy collectors, inspectors, chemists, assistant chemists, clerks, and messengers in the field and in the Bureau of Internal Revenue in the District of Columbia as may be necessary to enforce the provisions of this Act.

SECTION 11. That the sum of $150,000, or so much thereof as may be necessary, be, and hereby is, appropriated, out of any moneys in the Treasury not otherwise appropriated, for the purpose of carrying into effect the provisions of this Act.

SECTION 12. That nothing contained in this Act shall be construed to impair, alter, amend, or repeal any of the provisions of the Act of Congress approved June thirteenth, nineteen hundred and six, entitled "An Act for preventing the manufacture, sale, or transportation of adulterated or misbranded, or poisonous, or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes," and any amendment thereof, or of the Act approved February ninth, nineteen hundred and nine, entitled "An Act to prohibit the importation and use of opium for other than medicinal purposes," and any amendment thereof.

(Section 1008 of the Revenue Act of 1918, approved February 24, 1919.)

"That all opium, its salts, derivatives, and compounds, and coca leaves, salts, derivatives, and compounds thereof, which may now be under seizure or which may hereafter be seized by the United States Government from any person or persons charged with any violation of the Act of October 1, 1890, as amended by the Acts of March 3, 1897, February 9, 1909, and January 17, 1914, or the Act of December 17, 1914, shall upon conviction of the person or persons from whom seized be confiscated by and forfeited to the United States and the Secretary is hereby authorized to deliver for medical or scientific purposes to any department, bureau, or other agency of the United States Government, upon proper application therefor under such regulation as may be prescribed by the Commissioner, with the approval of the Secretary, any of the drugs so seized, confiscated, and forfeited to the United States.

"The provisions of this section shall also apply to any of the aforesaid drugs seized or coming into the possession of the United States in the enforcement of any of the above-mentioned acts, where the owner or owners thereof are unknown. None of the aforesaid drugs coming into possession of the United States under the operation of said acts, or the provisions of this section, shall be destroyed without certification by a committtee appointed by the Commissioner, with the approval of the Secretary, that they are of no value for medical or scientific purposes."

(Section 705 of the Revenue Act of 1926 approved February 26, 1926.)

"All opium, its salts, derivatives, and compounds, and coca leaves, salts, derivatives, and compounds thereof, which may now be under seizure or which may hereafter be seized by the United States Government from any person or persons charged with any violation of the Act of October 1, 1890, as amended by the Acts of March 3, 1897, February 9, 1909, and January 17, 1914, or the Act of December 17, 1914, as amended, shall upon conviction of the person or persons from whom seized be confiscated by and forfeited to the United States, and the Secretary is hereby authorized to deliver for medical or scientific purposes to any department, bureau, or other agency of the United States Government, upon proper application therefor under such regulation as may be prescribed by the Commissioner, with the approval of the Secretary, any of the drugs so seized, confiscated, and forfeited to the United States.

"The provisions of this section shall also apply to any of the aforesaid drugs seized or coming into the possession of the United States in the enforcement of any of the above-mentioned acts, where the owner or owners thereof are unknown. None of the aforesaid drugs coming into possession of the United States under the operation of said acts, or the provisions of this section, shall be destroyed without certification by a committee appointed by the Commissioner, with the approval of the Secretary, that they are of no value for medical or scientific purposes."

(The act of January 22, 1927).

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That section 2 of the narcotic act of Congress, approved December 17, 1914, as amended, be further amended as follows:

"Sec. 2. After the last sentence of section 2 add the following: 'The President is further authorized and directed to issue such Executive order as will permit those persons in the Virgin Islands of the United States lawfully entitled to sell, deal in, dispense, prescribe, and distribute the aforesaid drugs, to obtain said drugs from persons registered under this act within the continental United States for legitimate medical purposes, without regard to the order forms described in this section."

(The act entitled "An act to create a Bureau of Customs and a Bureau of Prohibition in the Department of the Treasury," approved March 3, 1927.)

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That there shall be in the Department of the Treasury a bureau to be known as the Bureau of Customs, a bureau to be known as the Bureau of Prohibition, a Commissioner of Customs, and a Commissioner of Prohibition. The Commissioner of Customs shall be at the head of the Bureau of Customs, and the Commissioner of Prohibition shall be at the head of the Bureau of Prohibition. The Commissioner of Customs and the Commissioner of Prohibition shall be appointed by the Secretary of the Treasury, without regard to the civil service laws, and each shall receive a salary at the rate of $8,000 per annum.

"Sec. 2. (a) The Secretary of the Treasury is authorized to appoint, in each of the bureaus established by section 1, one assistant commissioner, two deputy commissioners, one chief clerk, and such attorneys and other officers and employees as he may deem necessary. One of the deputy commissioners of the Bureau of Customs shall have charge of investigations. Appointments under this subdivision shall be subject to the provisions of the civil service laws, and the salaries shall be fixed in accordance with the classification act of 1923.

"(b) The Secretary of the Treasury is authorized to designate an officer of the Bureau of Customs to act as Commissioner of Customs, during the absence or disability of the Commissioner of Customs, or in the event that there is no Commissioner of Customs; and to designate an officer of the Bureau of Prohibition to act as Commissioner of Prohibition during the absence or disability of the Commissioner of Prohibition, or in the event that there is no Commissioner of Prohibition.

"(c) The personnel of the Bureau of Prohibition shall perform such duties as the Secretary of the Treasury or the Commissioner of Prohibition may prescribe, and the personnel of the Bureau of Customs shall perform such duties (other than duties in connection with the administration of the national prohibition act, as amended, or any other law relating to the enforcement of the eighteenth amendment), as the Secretary of the Treasury or the Commissioner of Customs may prescribe.

"Sec. 3. (a) The Secretary of the Treasury is authorized to confer or impose upon the Commissioner of Customs or any of the officers of the Bureau of Customs any of the rights, privileges, powers, or duties, in respect of the importation or entry of merchandise into, or exportation of merchandise from, the United States, vested in or imposed upon the Secretary of the Treasury by the tariff act of 1922, or any other law.

"(b) The records, property (including office equipment), and personnel of the Division of Customs are hereby transferred to the Bureau of Customs.

"(c) The Division of Customs and the offices of director of customs, assistant directors of customs, and director and assistant directors, Special Agency Service of the Customs, are hereby abolished.

"Sec. 4. (a) The rights, privileges, powers, and duties conferred or imposed upon the Commissioner of Internal Revenue and his assistants, agents, and inspectors, by any law, in respect of the taxation, importation, exportation, transportation, manufacture, production, compounding, sale, exchange, dispensing, giving away, possession, or use of beverages, intoxicating liquors, or narcotic drugs, or by the national prohibition act, as amended, or any other law relating to the enforcement of the eighteenth amendment, are hereby transferred to, and conferred and imposed upon, the Secretary of the Treasury.

"(b) The Secretary of the Treasury is authorized to confer or impose any of such rights, privileges, powers, and duties upon the Commissioner of Prohibition, or any of the officers or employees of the Bureau of Prohibition, and to confer or impose upon the Commissioner of Internal Revenue, or any of the officers or employees of the Bureau of Internal Revenue, any of such rights, privileges, powers, and duties which, in the opinion of the Secretary, may be necessary in connection with internal revenue taxes.

"Sec. 5. (a) The Secretary of the Treasury is authorized to transfer to the Bureau of Prohibition such records, property (including office equipment), and personnel of the office of the Commissioner of Internal Revenue as may be necessary for the exercise by the Bureau of Prohibition of the functions vested in it.

"(b) The Commissioner of Prohibition, with the approval of the Secretary of the Treasury, is authorized to appoint in the Bureau of Prohibition such employees in the field service as he may deem necessary, but all appointments of such employees shall be made subject to the provisions of the civil service laws, notwithstanding the provisions of section 38 of the national prohibition act, as amended. The term of office of any person who is transferred, under this section, to the Bureau of Prohibition, and who was not appointed subject to the provisions of the civil service laws, shall expire upon the expiration of six months from the effective date of this act.

"Sec. 6. Any action or decision of the Secretary of the Treasury under the national prohibition act, as amended, or of any officer upon whom the power to take such action or make such decision is conferred, shall be subject to the same review by a court of equity as the action or decision of the Commissioner of Internal Revenue under such act, as amended, prior to the effective date of this act.

"Sec. 7. This act shall take effect on April 1, 1927."

APPENDIX IX

DIGEST OF EDITORIAL LITERATURE ON HARRISON NARCOTIC LAW

Journal	Date	Title	Principle Discussed
N. Y. M. J.	Aug. 1914	A National Antinarcotic law	Inconvenience of registration for physicians. Exemptions of law.
J. A. M. A.	Mar. 6, 1915	The Harrison Law a National Obligation	Commends object of Act and urges physicians to support it.
"	Mar. 6, 1915	The Physician and the Harrison Narcotic Law	Explanatory summary of law.
"	Mar. 13, 1915	The Harrison Antinarcotic Law	In view of existing confusion, urges physicians to be patient and keep in mind general principles of law.
"	Apr. 10, 1915	Effects of the Harrison Law	Results of one month's operation of law.
"	June 19, 1915	Interpretations under the Harrison Narcotic Law	Question of whether or not "prescriptions" comes within definition of "preparations" under exemptions.
Medical Record	Feb. 13, 1915	The Antinarcotic Law	"Irksome provisions."
N. Y. M. J.	May 15, 1915	Mental Sequelae of the Harrison Law	Predictions as to effect of operation of law.
American Medicine	Nov. 1915	Narcotic Drug Addiction	Complexity of problem as result of law.
Boston Med. & Surg. Jour.	Mar. 23, 1916	First Year of the Harrison Narcotic Act	Evasion of law by unprincipled physicians.
N. Y. M. J.	May 27, 1916	A New Ruling in the Harrison Law	Prescribing for addicts.
J. A. M. A.	July 1, 1916	State Rights, State Duties, and the Harrison Narcotic Law	Possession, Jin Fuey Moy case.
Illinois Medical Journal	Aug. 1916	The New Ruling in the Harrison Law	Prescribing for addicts.
J. A. M. A.	Sept. 23, 1916	An Assault on the Harrison Narcotic Law	Renewal of Prescriptions and exemptions.
N. Y. M. J.	Nov. 1916	Holes in the Harrison Law.	Jin Fuey Moy case. Prescribing of any quantity.

Journal	Date	Title	Principle Discussed
J. A. M. A.	May 29, 1919	Increased Harrison Law Tax Unjust to Physicians	Increase of Tax to $3.
Boston Med. & Surg. Jour.	Nov. 13, 1919	Enforcement of the Harrison Narcotic Act	Prescribing for addicts.
American Medicine	Jan. 1920	The Problem of Narcotic Addiction	Undesirable features of enforcement.
N. Y. M. J.	Feb. 14, 1920	Enforcement of the Harrison Narcotic Law	Defense of Administration.
Medical Record	Jan. 1, 1921	The Growing Enslavement of the Profession of Medicine	Increasing restrictions around physicians.
"	Dec. 17, 1921	The Narcotic Agent and the Physician	Treatment of addiction.
American Medicine	Jan. 1922	A Congressional Investigation of the Narcotic Drug Problem	Investigation needed.
Medical Record	Jan. 21, 1922	A Much Needed Study of the Narcotic Problem	Recommends investigation.
"	Feb. 4, 1922	A Very Grave Charge	Charge made by Dr. Volk.
"	Feb. 18, 1922	Denial by Proxy of a Very Grave Charge	Letter to editor by Dr. J Milton Abbott.
"	Mar. 11, 1922	Concerning "A Very Grave Charge"	Letter to editor by Dr. L. D. Volk.
Illinois Medical Journal	Mar. 1922	Thanks to Their Ill-Begotten Narcotic Laws	Prescribing for incurable disease.
"	Mar. 1922	We Thank God for Judge Connor	Case of Dr. Manning.
"	Nov. 1922	Do We Need a New Narcotic Law?	Summary of criticisms.

Journal	Date	Title	Principle Discussed
Illinois Medical Journal	Feb. 1923	Some Relief from the Former Narcotic Restrictions	Prescribing for addicts and incurable diseases.
"	Mar. 1923	United States Assistant Attorney-General says Drug Problem is one for Physicians.	Statement before House Foreign Affairs Committee that Harrison Act is ineffective and impractical.
"	Mar. 1923	United States Turns to Doctors for Aid in Drug Fight	Plan to broaden regulations to encourage physicians to treat addicts and medical conference urged.
"	July 1923	Narcotic Addiction in the United States	Statement of Asst. U. S. Attorney-General Crim regarding underworld addicts and peddlers.
"	July 1923	Solving the Narcotic Problem	Discussions of addiction and Harrison Narcotic Law by Drs. Amos O. Squire, W. C. Fowler, Charles E. Terry and J. W. H. Crim.
Boston Medical & Surg. Journal	Jan. 31, 1924	Drug Addiction and Crime	Résumé of speech made by District Attorney of Suffolk County regarding prevalence of drug addiction and illicit traffic.
J. A. M. A.	June 14, 1924	Drug Addiction in the United States	Report of Kolb and DuMez of the Public Health Service, and statements of International Narcotic Education Association, Inc.
American Medicine	Aug. 1924	How Many Drug Addicts ?	Report of Kolb and DuMez.
Med. Journal & Record	Aug. 20, 1924	Drug Addiction	Report of Kolb and DuMez and statements of International Narcotic Education Association, Inc.
J. A. M. A.	Aug. 29, 1925	Lawless Law Enforcement	Refusal of collector to register physicians who are under indictment for violation of Harrison Narcotic Act.

Journal	Date	Title	Principle Discussed
J. A. M. A.	Feb. 27, 1926	United States Supreme Court Distrusts the Harrison Narcotic Act	Ruling of Supreme Court in relation to constitutionality of the Harrison Narcotic Act.
Illinois Medical Journal	April 1926	The Harrison Narcotic Act Unconstitutional	Ruling of Supreme Court in relation to constitutionality of the Harrison Narcotic Act.
"	May 8, 1926	The Incubus of the Harrison Narcotic Act	Increasing penalties and restrictions of physicians under Harrison Narcotic Act.
American Medicine	June 1926	The Harrison Narcotic Act	"
Illinois Medical Journal	June 1926	Stripping of Medical Profession of its Powers and giving them to a Body of Lawmakers	"
Medical Journal & Record	Oct. 20, 1926	The Harrison Narcotic Law	Regulation of narcotics by police rather than physicians.

BIBLIOGRAPHY

Achard, Ch., Henri Bénard and Ch. Gagneux. Action de la morphine sur les propriétés leucocytaires. Leuco-diagnostic du morphinisme. Bull. et mem. Soc. méd. Hôpitaux de Paris. 1909. Vol. 28. Ser. 3.

Achard, Ch. and Ramond. Recherche de la résistance leucocytaire. Comp. rend. Soc. de biol. Jan. 16, 1909. p. 110. Also Semaine méd. 1909. p. 47.

Adams, Francis. The Seven Books of Paulus Aegineta, translated from the Greek. London, 1844.

Adams, Samuel Hopkins. The great American fraud. Reprinted from Collier's by American Medical Association. 1913.

Albanese, M. Sur la transformation de la morphine dans l'organisme des animaux habitués au poison. Arch. ital. de biol. 1910. Vol. 53. pp. 439–444.

Alexander, A. Ueber Eukodalismus. Münch. med. Wchnschr. 1920. Vol. 67. p. 873.

Allbutt, Clifford. On the abuse of hypodermic injections of morphia. The Practitioner. 1870. Vol. 5. p. 327.

Allbutt, Thomas Clifford. A system of medicine. New York. 1905.

American Medical Association. Nostrums and Quackery. Reprinted with additions and modifications from J. A. M. A. 1912.

American Medical Association, Council on Health and Public Instruction. Report of the Committee on the Narcotic Drug Situation in the United States, J. A. M. A. May 8, 1920. Vol. 74. pp. 1324–1328.

Report of Committee on Narcotic Drugs. J. A. M. A. June 11, 1921. Vol. 76. No. 24. pp. 1669–1671.

American Medical Association, Council on Pharmacy and Chemistry. J. A. M. A. Oct. 20, 1906.

American Medicine. Editorial. November, 1915. New Series. Vol. 10. No. 11. pp. 799–801.

Editorial. January, 1920. pp. 13–14.

American Public Health Association, Food and Drugs Section. Report of Committee on Habit-forming Drugs. Am. J. Pub. Health. Jan. 1920.

Report of Committee on Narcotic Drug Addiction. Am. J. Pub. Health. Dec. 1921.

Anders, James M. and John H. Musser. Practice of medicine. 14th ed. 1920.

Argentina, Gasparo. Contributo alla immunizzazione per morfina. Gazz. d. ospedali e. d. clin. April 16, 1905. Vol. 26. pt. 1. pp. 484–485.

Aron, Max. *See Gelma, Eugène and Max Aron.*

Atwood, Charles E. A case of heroine habit. Med. Rec. June 3, 1905.

Babel, A. Ueber das Verhalten des Morphiums und seiner Derivate im Tierkörper. Arch. f. exper. Path. u. Pharmakol. 1905. Vol. 52. pp. 262–270.

Ball, B. Des lésions de la morphinomanie et de la présence de la morphine dans les viscères. Encéphale. 1887.

The morphine habit. 1887.

Ball, B. and O. Jennings. Considérations sur le traitement de la morphinomanie. Encéphale. 1887. Vol. 8. pp. 295–301.

Barbacci, Ottone. Die Nervenzelle in ihren anatomischen, physiologischen und pathologischen Beziehungen nach den neuesten Untersuchungen. Centralbl. f. allg. Path. u. path. Anat. 1899. Vol. 10. pp. 757–823; 865–936.

Bartholow, R. A Manual of hypodermatic medication. Philadelphia. 1891.

Bastedo, Walter A. Materia medica: pharmacology: therapeutics. 2nd ed. 1918.

Baumm, F. Unsere Erfahrungen mit Eukodal. Therap. Monatsch. 1919. Vol. 33. pp. 219–220.

Beates, Henry Jr. A brief consideration of some mental characteristics of the narcotic habitué and a suggestion for a feature in management. Interstate Medical Jour. 1916. Vol. 23. pp. 437–441.

Belbey, José C. *See Rojas, Nerio and Josè C. Belbey.*

Belgrano, C. R. *See Berri, G. C. and C. R. Belgrano.*

Bell, F. McKelvey. Morphinism and morphinomania. New York M. J. 1911. Vol. 93. pp. 680–682.

Bénard, Henri. *See Achard, Ch., Henri Bénard and Ch. Gagneux.*

Berri, G. C. and C. R. Belgrano. Aggressine rispetto alla cocaina ed alla morfina. Annali dell' Istituto Maragliano. 1911. Vol. 5. pp. 42–49.

Biberfeld, J. Ueber die Mengenverhältnisse der Hirnlipoide morphingewöhnter Hunde. Biochem. Ztschr. 1915. Vol. 70. pp. 158–163.

Zur Kentnis der Morphingewöhnung. II. Mitteilung. Ueber die Spezificität der Morphingewöhnung. Biochem. Ztschr. 1916. Vol. 77. pp. 283–297.

Ueber Gewöhnung an Kodeinderivate. (Eukodal u. Parakodin). Biochem. Ztschr. 1920. Vol. III. pp. 91–104.

Entwöhnungsversuche. Biochem. Ztschr. 1921. Vol. 122. pp. 260–268.

Bishop, Ernest S. Morphinism and its treatment. J. A. M. A. May 18, 1912. Vol. 58. pp. 1499–1504.

Narcotic addiction. A systemic disease condition. J. A. M. A. Feb. 8, 1913. Vol. 60. pp. 431–434.

The narcotic drug problem. New York. 1920.

Blair, T. S. Narcotic drug addiction as regulated by a state department of health. J. A. M. A. May 17, 1919.

Block, S. Drug habitués. New York M. J. Feb. 27, 1916.

Bloedorn, Walter A. Studies of drug addicts. U. S. Naval Medical Bulletin. 1917. Vol. 11. No. 3.

Drug addiction. J. A. M. A. Jan. 25, 1919.

Bógolow, T. M. Die Heilung von Narkomanen durch subkutane Zufuhr von Sauerstoff. Moscow Med. J. 1925. No. 10. Abstr. in Münch. med. Wchnschr. 1926. Vol. 73. p. 132.

Bougault, J. Oxydation de la morphine par le suc de Russula delica. Jour. de Pharm. et de Chim. 1902. Vol. 16. pp. 49–52.

Bougrier, Léon. Étude chimique, physiologique et clinique sur l'héroine. Thèse de Paris. 1899.

Bouma, Jac. Ueber Gewöhnungsversuche mit Kodein. Arch. f. exper. Path. u. Pharmakol. 1903. Vol. 50. pp. 353–360.

Brauchli, E. *See Cloetta, M. and E. Brauchli.*

Braunlich, A. R. Treatment of drug addiction at Riverside Hospital. Month. Bull. Department of Health, City of New York. Feb. 1920. pp. 47–49.

Brown, Lucius P. Enforcement of the Tennessee Anti-Narcotic Law. Am. J. Public Health. 1915. Vol. 5. No. 4. pp. 323–333.

Brown, S. H. and E. D. Tompkins. Therap. Gaz. Aug. 15, 1900.

Buckley, A. C. Basis of psychiatry. 1920.

Bureau. Accouchement d'une morphinomane; preuve chimique du passage de la morphine à travers le placenta; réflexions. Bull. et mem. Soc. obst. et gyn. de Paris. 1895. pp. 356–362.

Burkart, R. Ueber Wesen und Behandlung der chronischen Morphiumvergiftung. 1884.

Burr, C. B. Handbook of psychology and mental diseases. 4th Edition. 1916.

Butler, G. F. A textbook of materia medica, therapeutics and pharmacology. 6th ed. 1908.

Butler, Willis P. Report of Louisiana State Board of Health Narcotic Dispensary and Institutional Treatment Department. January 1, 1921.

Buvat, J. B. *See Comar, G. and J. B. Buvat.*

CALKINS, ALONZO. Opium and the opium appetite. 1871.

CALVET, LEOPOLD. Essai sur le morphinisme aigu et chronique: Étude experimentale et clinique sur l'action physiologique de la morphine. 1877.

CARLISLE, F. H. Drug treatment of morphinism. Boston M. and S. J. Feb. 8, 1917.

CARTER, M. G., T. J. ORBISON, E. H. STEELE, C. A. WRIGHT, and E. H. WILLIAMS. The proteal treatment of drug addiction. Med. J. & Rec. Sept. 7, 1927. pp. 282–284.

CARTER, C. W. The nature of the morphine disease. Lancet-Clinic. 1908. Vol. 9. pp. 500–502.

CASE. C. L. The pathology and treatment of the morphine habit. Med. Council. 1910. Vol. 15. pp. 307–311.

CENTER, C. D. An inquiry into the action of heroin hydrochloride. Med. Fortnightly. 1901. Vol. 19.

CHAMBARD. Les morphinomanes. Bibliothèque médicale Charcot. Debove.

CHARTIER and MORAT. Les variations de la formule sanguine chez les morphinomanes et les héroinomanes au cours de la désintoxication rapide par la méthode de Sollier. Compt. rend. Soc. de biol. June 25, 1909. Vol. 66. No. 22. pp. 1025–1027.

CHOTZEN, F. Zur Kenntnis der Psychosen der Morphiumabstinenz. Allg. Ztschr. f. Psychiat. u. psych. gerichtl. Med. 1906. Vol. 63. pp. 786–803.

CHURCH, ARCHIBALD and FREDERICK PETERSON. Nervous and mental diseases. 8th ed. 1914.

CLAUDE, HENRI. Sur quelques poisons sociaux; la morphine et la cocaïne. Révue scientifique, 1923. Vol. 61. No. 16. pp. 509–515.

CLOETTA, M. Ueber das Verhalten des Morphins im Organismus und die Ursachen der Angewöhnung an dasselbe. Arch. f. exp. Path. u. Pharm. December 17, 1903. Vol. 50. pp. 453–480.

CLOETTA, M. and E. BRAUCHLI. Der Einfluss des Morphins auf den Ionengehalt des Blutplasmas. Arch. f. exper. Path. u. Pharmakol. 1926. Vol. 3. pp. 254–262.

COBBE, WILLIAM ROSSER. Doctor Judas, a portrayal of the opium habit. Chicago. 1895.

COHEN, J. *See McPherson, G. E. and J. Cohen.*

COLLINS, CORNELIUS F. Proceedings 13th Annual Conference New York State Association of Magistrates. Feb. 6–7, 1922. Report of Committee on Drug Evil. pp. 117–129.

Proceedings 14th Annual Conference New York State Association of Magistrates. Feb. 5–6, 1923. Report of Committee on Drug Evil. pp. 87–90.

COLLINS, K. H. and A. L. TATUM. A conditioned salivary reflex established by chronic morphine poisoning. Am. J. Physiol. Sept. 1925. No. 1. pp. 14–15.

COMAR, G. and J. B. BUVAT. Les toxicomanes. Presse méd. July 6, 1904.

CONFERENCE OF STATE AND PROVINCIAL HEALTH AUTHORITIES OF NORTH AMERICA. Report of the Committee on Drug Addiction. Proceedings. 1919–21. p. 58.

Report of the Committee on Drug Addiction. Proceedings. 1922.

COPELAND, R. S. The narcotic drug evil and the New York City Health Department. Amer. Med. January 1920. pp. 17–23.

CRAIG, M. Psychological medicine. 1917.

CREUTZFELDT, HANS GERHARD. Histologischer Befund bei Morphinismus mit Morphium- und Veronalvergiftung. 1926. Vol. 101. pp. 97–108.

CRIM, JOHN W. H. Narcotic addiction in the United States. Senate Committee Print. 67th Cong. 4th Sess.

CROTHERS, T. D. Morphinism and narcomania from other drugs. 1902.

Drug addictions and their treatment. Med. Rec. 1916. Vol. 90. pp. 238–241.

CULBRETH, D. M. R. Materia medica and pharmacology. 1903. 3d edition.

CUSHNY, A. R. Pharmacology and therapeutics or the action of drugs. 1918.

Daly, J. R. L. Boston M. and S. J. Feb. 22, 1900.

Dana, C. L. Problems of drug addiction. Med. Rec. Feb. 2, 1918. Vol. 93. p. 177.

David, Erich. Ueber Morphinismus. Ztschr. f. d. g. Neurol. u. Psychiat. 1924. Vol. 89. pp. 613–617.

Ueber die Ursachen der so häufigen Rückfälligkeit nach der Morphiumentwöhnung. Ztschr. f. d. g. Neurol. u. Psychiat. 1925. Vol. 99. pp. 475–484.

Day, Horace. The opium habit. 1868.

Deering, B. T. Sur le traitement de la morphinomanie par la suppression brusque. Paris. 1891.

See also Lutaud, A. and B. Deering.

Densten, J. C. Drug addiction and the Harrison Anti-Narcotic Law. New York M. J., Apr. 21, 1917.

Dercum, Francis X. Relat ve frequency of drug addiction among middle and upper classes; treatment and final results. Penn. Med. Jour. February, 1917.

Rest, suggestion and other therapeutic measures in nervous and mental diseases. 2d ed. 1917.

Devay, F. *See Guinard, L. and F. Devay.*

Diederich, Georg. Ueber Oxydimorphin und seine Wirkungen auf den Organismus. Dis. Göttingen. 1883.

Diner, Jacob. Drug addiction and its treatment. Med. Record. Aug. 24, 1918.

Dominick, H. Ueber Morphinentziehung und die in ihrem Verlauf vorkommenden Psychosen. Inaug. Dissert. Kiel. 1914.

Donath, J. Das Schicksal des Morphins im Organismus. Arch. f. d. ges. Physiol. 1886. Vol. 38. pp. 528–548.

van Dongen, K. Beiträge zur Frage der Morphingewöhnung. Arch. f. Physiologie. 1915. Vol. 162. pp. 54–66.

Doering, Michael. Acroama medico-philosophicum de opii usu. 1620.

Dorlencourt, H. Étude sur la déstruction "in vitro" du chlorhydrate de morphine, par les organes d'animaux accoutumés et non accoutumés. Séances et Mémoires de la Soc. de biol. 1913. Vol. 74. pp. 895–897.

Douglas, C. J. Morphine in general practice. New York M. J. April 26, 1913.

Dreser, H. Pharmakologisches ueber einige Morphinderivate. Therap. Monatschr. 1898. Vol. 12. pp. 509–512.

Duhem, P. L'heroïne et les heroïnomanes. Progrès. méd. 1907. 3s. Vol. 23. pp. 113–117.

DuMez, A. G. Increased tolerance and withdrawal phenomena in chronic morphinism. J. A. M. A. Apr. 12, 1919. Vol. 72. p. 1069.

Per capita medicinal requirements of narcotics. Data secured in a narcotic survey of Allegany County, Maryland. Public Health Reports. Vol. 39. No. 37. Sept. 12, 1924.

DuMez, A. G. and Lawrence Kolb. Absence of transferable immunizing substances in the blood of morphine and heroin addicts. Public Health Reports. Vol. 40. No. 12. March 20, 1925. pp. 548–559.

See also Kolb, Lawrence and A. G. DuMez.

Dupouy, R. Morphinomanie familiale d'origine thérapeutique; deux morts; deux guérisons après vingt ans de morphinisme continu. Encéphale. 1912. Vol 2. pp. 499–501.

Quelques réflexions sur la morphinomanie. Ann. med.-psychol. 1922. pp. 453–466.

Traitement de la morphinomanie. Bull. Med. Oct. 25, 1924. Vol. 38. pp. 1193–1197.

Earle, C. W. The opium habit; a statistical and clinical lecture. Chicago Med. Rev. 1880. Vol. 2. pp. 442–446; 493–498.

Earle, F. B. Maternal opium habit and infant mortality. Med. Standard. 1888. Vol. 3. pp. 2–4.

Eberle, E. G. Report of Committee on the acquirement of drug habits. Am. J. Pharm. Oct., 1903. pp. 474–488.

van Egmond, A. A. Ueber die Wirkung des Morphins auf das Herz (zugleich ein Beitrag zur Frage der Morphingewöhnung). Arch. f. exp. Path. u. Pharmakol. 1911. Vol. 65. pp. 197–213.

Einhorn, M. Phila. Med. Jour. Oct. 28, 1899.

Erlenmeyer, A. Considérations sur la morphinomanie et son traitement. Encéphale. 1886. Vol. 6. pp. 677–708.

Die Morphiumsucht. 1883. Chapter on treatment translated by E. P. Hurd. 1889.

Behandlung des chronischen Morphinismus und Cocainismus. In: Penzoldt und Stintzing. Vol. 1. 1909.

Zur Theorie und Therapie des Morphinismus. Neurol u. Psychiat. 1926. Vol. 103. pp. 705–718.

Eshner, A. A. *See Wilson, J. C. and A. A. Eshner.*

Ettinger, Alice. *See Joël, Ernst and Alice Ettinger.*

Ewing, J. Studies on ganglion cells. Arch. Neur. and Psych. 1898. Vol. 1. No. 3. pp. 263–440.

Farr, C. B. The relative frequency of the morphine and heroin habits. New York M. J. May 1, 1915.

Fauser, A. Versuch einer Begründung von Zusammenhängen zwischen gewissen elementaren psychopathologischen Symptomen und physikalisch-chemischen Zustandveränderungen des Körpers. Ztschr. f. d. ges. Neurol. u. Psychiat. 1923. Vol. 81. pp. 497–516.

Fauser, A. and B. Ottenstein. Chemisches und Physikalisch-Chemisches zum Problem der ‘Suchten’ und ‘Entziehungserscheinungen,’ insbesondere des Morphinismus und Cocainismus. Ztschr. f. d. ges. Neurol. und Psych. 1924. Vol. 88. pp. 128–133.

Faust, E. S. Ueber die Ursachen der Gewöhnung an Morphin. Arch. f. exper. Path. u. Pharm. 1900. Vol. 44. pp. 217–238.

Féré, Ch. De la morphinomanie au point de vue de la grossesse et de la vie du foetus. Semaine méd. 1883. p. 294.

Ferrai, C. Sul potere anticomplementare della morfina. Pathologica. September 1909. Vol. 1. pp. 505–511.

Feuillé. Leucopathies, métastases, albuminurie et ictères leucopathiques. Thèse de Paris. 1909.

Fleming, Alexander. Brit. M. J. Feb. 15, 1868.

Floeckinger, F. C. New Orleans Med. and Surg. J. May, 1900.

Floret. Klinische Versuche ueber die Wirkung und Anwendung des Heroins. Therap. Monatsch. 1898. Vol. 12. p. 512.

Flury. Arch. f. exper. Path. u. Pharmakol. 1914. p. 105.

Fränkel, F. *See Joël, E. and F. Fränkel.*

French, James M. Textbook of practice of medicine. 1903.

Fuller, S. C. A phenomenon observed in the blood of morphinomaniacs. New England Med. Gaz. June 1899. Vol. 34. No. 6. pp. 241–250.

Fulton, H. D. New York M. J. Dec. 20, 1899.

Fürer. Morphinismus. Neurol. Centralbl. 1909. Vol. 28. pp. 656–657.

Fussell, M. Howard. *See Tyson, James and M. Howard Fussell.*

Gagneux, Ch. *See Achard, Ch., Henri Bénard and Ch. Gagneux.*

Garrison, Fielding H. An introduction to the history of medicine, Philadelphia, 1922.

Geis, N. P. Heroin as an analgesic. New York M. J. 1900.

Gelma, Eugène. De quelques particularités sur la morphinomanie et la démorphinisation. Gaz. méd. et rév. d'hyg. soc. de Strasbourg. April, 1922. Vol. 80. No. 4. pp. 143–148.

Gelma, Eugène and Max Aron. Action comparée de la morphine et de la malonylurée sur le développement des larves d'anoures. Compt. rend. d. séances de la Soc. de biol. July 9, 1926. Vol. 95. p. 696.

Gifford, S. L. Types of cases illustrating the action of heroin hydrochloride. International Med. Mag. 1900.

Gioffredi, C. L'immunité artificielle par les alcaloïdes. Arch. ital. de biol. 1897. Vol. 28. pp. 402–407.

Recherches ultérieures sur l'immunisation pour la morphine. Arch. ital. de biol. 1899. Vol. 31. pp. 398–411.

L'assuefazione sperimentale alla morfina. Gior. internaz. delle scienze med. 1900. Vol. 22. pp. 790–796.

Gordon, A. The relation of legislative acts to the problem of drug addiction. J. Crim. Law and Criminol. July, 1917. Vol. 8. Also Virginia M. Semi-month. 1917–1918. Vol. 22. pp. 57–59.

Graham-Mulhall, S. Experience in narcotic drug control in the State of New York. New York M. J. Jan. 15, 1921. Vol. 113. pp. 106–111.

Symposium on narcotic drug addiction. Am. J. Pub. Health. January, 1921.

Greenfield, Arthur D. *See Pellini, Emil J. and Arthur D. Greenfield.*

Grinnell, A. P. A review of drug consumption and alcohol as found in proprietary medicine. Medico-Legal Journal. December 1905–January 1906. Vol. 23. pp. 426; 589.

Grossman, O. *See Klee, Ph. and O. Grossman.*

Grüter, M. Ueber die Zerstörung von Morphin und Morphinderivaten bei der Entwicklung von Hühnerembryonen. Arch. f. exper. Path. u. Pharmakol. 1916. Vol. 79. pp. 337–360.

Guinard, L. and F. Devay. Observation d'un cas de morphinisme chronique chez un chien. J. méd. vét. et zoötech. 1894. Vol. 19. pp. 261–269.

Gunn, J. A. Cellular immunity; congenital and acquired tolerance to non-protein substances. Physiological Review. Jan. 1923. Vol. 3. pp. 41–74.

Hadley. Congressional Record. May 4, 1922. p. 6886.

Hamilton, J. A. Drug addiction and crime. New York M. J. 1919. Vol. 110. p. 760.

Handy, Hast. On opium. Thesis for degree of doctor of medicine at the College of Philadelphia. 1791.

Happel, T. J. Morphinism in its relation to the sexual functions and appetite, and its effect on the offspring of the users of drugs. Med. and Surg. Rep. 1892. Vol. 67. pp. 403–407.

Hare, Hobart A. Practical therapeutics. 16th ed. 1916.

Discussion in "The Doctor and the Drug Addict." Symposium, Philadelphia County Medical Society. J. A. M. A. Dec. 4, 1920.

Harnack, E. Ueber die Giftigkeit des Heroins. Münch. med. Wchnschr. 1899. No. 27.

Hartwell, B. H. The sale and use of opium in Massachusetts. Annual Report. Massachusetts State Board of Health. 1889. Vol. 20. pp. 137–158.

Hecht, Adolf F. Pharmakodynamische Untersuchungen an der lebenden Haut. V. Die Allergie der menschlichen Haut gegenueber primären Giften und die Morphinempfindlichkeit nach Morphingebrauch. Ztschr. f. g. exp. Med. 1923. Vol. 38. pp. 123–130.

Henderson, D. K. The treatment of drug addiction. Glasgow Med. Jour. 1916.

Herwirsch, C. Heroin in cough. Therap. Gaz. 1899.

Hildebrandt, F. Ueber Veränderungen des Stoffswechsels nach chronischer Morphinzufuhr. Arch. f. exper. Path. u. Pharmakol. 1922. Vol. 92. pp. 68–95.

Hippocrates. T. VIII. Liv. II. p. 253. Sec. 116. Also p. 386. Sec. 201.

Hirschlaff, Leo. Ein Heilserum zur Bekämpfung der Morphiumvergiftung und ähnlicher Intoxicationen. Berl. Klin. Wchnschr. 1902. pp. 1149–1152; 1174–1177.

Zur klinischen Anwendung des Morphinheilserums. Ztschr. f. Krankenpfl. 1903. Vol. 25. pp. 467–473; 426–431.

Ueber das Morphin-Heilserum (Eumorphol-Riedel).

HITZIG, E. Morphium Abstinenzerscheinungen und Magen. Berl. Klin. Wchnschr. 1892. Vol. 29. pp. 1237–1240.

HOLTKAMPF, A. Weitere Mittheilungen ueber therapeutische Versuche mit Heroin. Deutsche med. Wchnschr. Apr. 6, 1899.

HORIUCHI, M. Ueber die Befunde der Nebenniere bei experimenteller Morphiumvergiftung. Trans. Japan Path. Soc. Tokyo. 1923. Vol. 13. p. 47.

HOWLETT, K. S. Drug addiction and newborn. J. Tenn. M. A. Apr. 1918. Vol. 10. p. 468.

HUBBARD, S. DANA. The New York City Narcotic Clinic and differing points of view on narcotic addiction. Monthly Bulletin. Department of Health, City of New York. February, 1920. Vol. 10. No. 2.

Some fallacies regarding narcotic drug addiction. J. A. M. A. May 22, 1920.

HULL, J. M. The opium habit. Biennial Report. Iowa State Board of Health. 1885. Vol. 3. pp. 535–545.

HYAMS, B. Therapeutic studies of heroin hydrochloride. Med. News. 1900.

HYNSON, H. P. Report of Committee on Acquirement of the Drug Habit. Amer. Jour. Pharm. November 1902. pp. 547–554.

INSTITUTE OF CRIMINAL LAW AND CRIMINOLOGY. Report of Committee "G," Francis Fisher Kane, Chairman. "Drugs and Crime." J Amer. Inst. Crim. Law and Criminol. Nov. 1917. Vol. 8. No. 4.

JACKSONVILLE, FLORIDA, BOARD OF HEALTH. Annual Reports for 1912–1913–1914.

JACOBI, J. Ueber die Wirkung des Heroins. Wien. Med. Wchnschr. 1901.

JACOTTET, G. Étude sur les alterations des cellules nerveuses de la moelle et des ganglions spinaux dans quelques intoxications experimentales. Ziegler's Beitr. 1898. Vol. 22. Part 3.

JARRIGE, J. L. Héroïnomanie. Paris Thesis. 1902.

JELLIFFE, S. E. Drug addictions: preliminary Report of the Committee on Nervous and Mental Diseases. J. A. M. A. 1905. Vol. 46. p. 643.

JELLIFFE, S. E. and W. A. WHITE. Diseases of the nervous system. 1919.

JENNINGS, OSCAR. The morphia habit and its voluntary resignation. New York. 1899.

See also Ball, B. and O. Jennings.

JOËL, ERNST. Zur Pathologie der Gewöhnung. Therap. Gegenwart. 1923. Vol. 64. pp. 397–403; 441–447.

JOËL, ERNST and ALICE ETTINGER. Zur Pathologie der Gewöhnung. III. Mitteilung. Experimentelle Studien ueber Morphingewöhnung. Archiv. f. exper. Path. u. Pharmakol. 1926. Vol. 115. pp. 334–350.

JOËL, ERNST and FRITZ FRÄNKEL. Zur Pathologie der Gewöhnung. II. Mitteilung. Ueber Gewöhnheit und psychische Gewöhnung. Therapie der Gegenwart. Feb. 1926.

Oeffentliche Massnahmen gegen den Missbrauch von Betaubungsmitteln. Klin. Wchnschr. 1927. Vol. 6. No. 22.

JOHNSON, GEORGE S. The use of narcosan in the treatment of drug addiction. Colorado Med. Nov., 1927. Vol. 24. No. 11.

JONES, JOHN. The mysteries of opium revealed. 1700.

JOUET, DANIEL. Étude sur le morphinisme chronique. Thèse de Paris. 1883.

JOYCE, T. F. Treatment of drug addiction. New York M. J. Aug. 14, 1920.

KAI, SOTARO. *See Teruuchi, Yutaka and Sotaro Kai.*

KANE, H. H. The hypodermic injection of morphia. Its history, advantages, and dangers. Based on experience of 360 physicians. New York. 1880.

Opium smoking in America and China. New York. 1882.

Kengla, L. A. Codein in the treatment of the morphine habit. Occidental Med. Times. 1895. Vol. 9. pp. 541–544.

Kennedy, Foster. The effects of narcotic drug addiction. New York M. J. 1914. Vol. 100. pp. 20–22.

Keown, T. W. Carolina Med. J. 1901.

Klee, Ph. and O. Grossman. Ueber die klinische Brauchbarkeit des Cholins. Münch. med. Wchnschr. Feb. 13, 1925. Vol. 72. pp. 251–254.

Knopf, S. A. The one million drug addicts in the United States. Med. J. and Rec. Feb. 6, 1924. pp. 135–139.

Kober, George M. Report of Committee on Social Betterment. President's Homes Commission, Washington. 1908.

Kobert, R. Lehrbuch der Intoxikationen. 1906.

Kogerer, H. Erfahrungen ueber die Hechtsche allergische Reaktion bei Morphinisten. Wien. med. Wchnschr. 1920. Vol. 70. p. 1045.

Kolb, Lawrence. Drug addiction in its relation to crime. J. Ment. Hyg. Jan. 1925. Vol. 9. No. 1. pp. 74–89.

The relation of intelligence to the etiology of drug addiction. Am. J. Psychiat. July, 1925. Vol. 5. No. 1. pp. 163–167.

Pleasure and deterioration from narcotic addiction. J. Ment. Hyg. Oct. 1925. Vol. 9. No. 4. pp. 699–724.

Clinical contribution to drug addiction: The struggle for cure and the conscious reasons for relapse. J. Nerv. and Ment. Dis. July, 1927. Vol. 66. No. 1.

Kolb, Lawrence and A. G. DuMez. The prevalence and trend of drug addiction in the United States and factors influencing it. Public Health Reports. May 23, 1924.

Kraepelin, Emil. Psychiatrie: Ein Lehrbuch für Studierende und Aerzte. 1909–1915. 8th ed. Vol. 2. Klinische Psychiatrie. pp. 206–228.

Lectures on clinical psychiatry. 1912.

Krafft-Ebing, R. Textbook on insanity. 1904.

Kraus, Walter Max. An analysis of the action of morphine upon the vegetative nervous system of man. J. Nerv. & Ment. Dis. July, 1918. Vol. 48. pp. 36–60.

Krauss, R. Morphinismus und Homosexualität. Ztschr. f. d. ges. Neur. u. Psychiat. 1926. Vol. 101. pp. 271–277.

Kropil. Ueber die Unschädlichkeit des Heroins. Allg. med. Centralztschr. 1900. Vol. 69. pp. 461–462.

Laase, Christian F. J. Practical application of the facts of narcotic drug addiction disease. Med. Record. August 9, 1919.

Lambert, Alexander. Osler and McCrae's "Modern Medicine." 1907. Vol. 1. pp. 210–217.

The treatment of narcotic addiction. J. A. M. A. June 21, 1913. Vol. 60. No. 25.

Osler and McCrae's "Modern Medicine." 1914. Vol. 2. pp. 438–444.

The intoxication impulse. Med. Rec. 1915. Vol. 87. pp. 253–259.

The doctor and the drug addict. Symposium. Phila. County Med. Soc. Nov. 10, 1920.

Scope of therapeutics in the relief of narcotism. Symposium Philadelphia County Medical Society. J. A. M. A. Dec. 4, 1920. Vol. 75. pp. 1589–1591.

The amount of opiate used in the legitimate practice of medicine. J. A. M. A. May 20, 1922. Vol. 78. No. 20.

Nelson's Loose-Leaf Medicine. Vol. II pp. 607A–609A; 611 (i)–611 (iv).

Lambert, Alexander and Frederick Tilney. The treatment of narcotic addiction by narcosan. Med. J. & Rec. Dec. 15, 1926. Vol. 124. No. 12. pp. 764–768.

Lancelin, L. E. R. Morphinisme et infections: Rôle des leucocytes. Thèse de Bordeaux. 1902.

Lane, H. C. New method for detecting drug habitués. N. Y. Med. J. Aug. 14, 1920. Vol. 112. p. 222.

Lang, C. J. Heroin. Med. Times and Register. 1899. Vol. 37. p. 79.

Langer, Hans. Ueber Heroinausscheidung und -gewöhnung Biochem. Ztschr. 1912. Vol. 45. pp. 221–238.

Lazarus, B. A contribution to the therapeutic action of heroin. Boston M. & S. J. 1900.

League of Nations. Report of the Advisory Committee on Traffic in Opium. First Session. May 2–5, 1921.

Minutes of the Thirteenth Session of the Council. June 17–28, 1921.

Resolutions adopted by the Council of the League of Nations. Thirteenth Session. June 17–28, 1921.

Resolutions and Recommendations adopted by the Assembly during its second Session. Sept. 5–Oct. 5, 1921.

Traffic in Opium. Report of the Fifth Committee to the Second Assembly. Sept. 24, 1921.

Report of the Advisory Committee on Traffic in Opium during its second Session. Apr. 19–29, 1922. A-15. 1922. C-223 (1) 1922. XI.

Minutes of the Eighteenth Session of the Council. Official Journal. June 1922. Vol. 3. No. 6.

Supplementary Report. Advisory Committee on Traffic in Opium. Third Session. Sept. 1, 1922.

Resolutions and Recommendations of the Third Assembly. September 4–30, 1922. Official Journal Special Supplement. October 1922.

Mixed Sub-Committee of the Health Committee and of the Advisory Committee on the Traffic in Opium. Report on discussions. First session. Jan. 4–6, 1923. C. 79. M. 33. 1923.

Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the work of the Committee during its Fourth Session. Jan. 8–14, 1923. C. 37–1923. IV.

Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to Council on work of Fifth Session. May 24–June 7, 1923.

Report and resolutions of the Advisory Committee on Traffic in Opium. Official Journal. August, 1923. pp. 1019–1027.

Journal of the Fourth Assembly. No. 23. September 28, 1923.

Resolution adopted by the Council of the League of Nations. Twenty-seventh Session. February, 1924.

Advisory Committee on Traffic in Opium and Other Dangerous Drugs. Report to Council on the work of the Committee during its Sixth Session. August 4–14, 1924. A. 32. 1924. XI.

Health Committee. Minutes of Third Session. September 29–Oct. 4, 1924. Document C. 588. M. 202. 1924. II.

Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to council on the work of the seventh session. Aug. 21–25, 1925.

Official Journal. Special Supplement No. 32. Oct., 1925.

Report of Commission of Enquiry into the Production of Opium in Persia. 1926. A. 7. 1927. XI. C. 580. M. 219. 1926. XI.

Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the work of the eighth session of the committee. May 26–June 8, 1926.

Report of the Fifth Committee to the Assembly. Sept. 17, 1926.

Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the work of the ninth session of the Committee. Jan. 17–Feb. 3, 1927.

Commission of Enquiry into the Production of Opium in Persia. March 28, 1927. A. 8. 1927. XI.

Commission of Enquiry into the Production of Opium in Persia. June 1, 1927. A. 16. 1927. XI.

Report of the Fifth Committee to the Assembly. Sept. 16, 1927. A. 64. 1927. XI.

Advisory Committee on Traffic in Opium and other Dangerous Drugs. Report to the Council on the work of the Tenth Extraordinary Session of the Committee. Sept. 28–Oct. 8, 1927. C. 521. M. 179. 1927. XI. (O. C. 686 (1)).

LEGEWIE, B. Delirium bei Morphinismus. Zugleich ein Beitrag zur Frage der Morphingewöhnung. Ztschr. f. d. ges. Neurol. u. Psychiat. 1924. Vol. 89. pp. 558–578.

LEVINSTEIN, EDOUARD. Die Morphiumsucht. Berl. klin. Wchnschr. Nov. 29, 1875. Vol. 12. pp. 646–649.

Die Morphiumsucht. Translated by Charles Harrer. London. 1878.

Die Morphiumsucht. 1883. 3d. ed.

LICHTENSTEIN, PERRY M. Narcotic addiction. Based on observation and treatment of one thousand cases. N. Y. Med. J. Nov. 14, 1914.

Infant drug addicts. N. Y. Med. J. Oct. 30, 1915.

LITTLE. Month. J. Med. Sci. June, 1850. p. 530.

LOOFS, F. A. Ueber die Möglichkeit einer klinisch-chemischen Kontrolle des Morphinismus. Bemerkungen zur Theorie der Morphingewöhnung. Ztschr. f. d. ges. Neurol. u. Psychiat. 1922. Vol. 79. pp. 433–462.

LOTT, M. K. The drug habit: its treatment. Texas M. J. Nov. 1901. Vol. 17. No. 5. pp. 157–162.

LOWENTHAL. Heroin in the treatment of phthisical cough and whooping cough. Philadelphia M. J. 1900.

LUDLOW, FITZHUGH. What shall they do to be saved? Harper's Magazine. August. 1867.

LUDLUM, S. D. and ELLICE McDONALD. Morphine hunger and the smooth muscle reaction. A study of the habitué. J. A. M. A. March 20, 1926. Vol. 86. p. 835.

LUTAUD, A. and B. DEERING. Le traitement de la morphinomanie par la suppression brusque. Jour. de med. de Paris. 1899. 2s. Vol. 11. pp. 61–63.

LUZZATO, R. Ueber die Natur und die Ursachen der Morphinglykosurie. Arch. f. exper. Path. u. Pharmakol. 1905. Vol. 52. pp. 95–106.

McDONALD, ELLICE. *See Ludlum, S. D. and Ellice McDonald.*

McFARLAND, S. F. Opium inebriety and the hypodermic syringe. Transactions New York State Med. Soc. 1877. p. 289–293.

McGEE, J. B. Heroin in coughs. Cleveland J. Med. 1900. Vol. 5.

McIVER, JOSEPH and GEORGE E. PRICE. Drug addiction. Analysis of one hundred and forty-seven cases at the Philadelphia General Hospital. J. A. M. A. Feb. 12, 1916.

MACKAY, LOIS L. *See Mackay, Eaton M. and Lois L. Mackay.*

MACKAY, EATON M. and LOIS L. MACKAY. Resistance to morphine in experimental uremia. Proceedings of the society for Experimental Biology and Medicine. 1926. Vol. 24. p. 129.

MACMURRAY, JOHN VAN A., editor. Treaties and agreements with and concerning China. 1894–1919. Vol. 2. Republican period. 1912–1919. p. 942.

McPHERSON, G. E. and J. COHEN. Survey of 100 cases of drug addiction entering Camp Upton, New York, via the draft, 1918. Boston M. & S. J. June 5, 1919.

MACHT, DAVID I. The history of opium and some of its preparations and alkaloids. J. A. M. A. Feb. 6, 1915.

History of intravenous and subcutaneous administration of drugs. J. A. M. A. Mar. 18, 1916.

MACKIN, M. C. Morphine addiction. Bull. Iowa Inst. 1919. Vol. 21. pp. 171–176.

MAGUIN, MAURICE. Morphinomanie et morphinisme. L'Écho méd. Aug. 1, 8, 15, 1909. Vol. 13.

MANGES, M. New York M. J. Nov. 26, 1898.

A second report on the therapeutics of heroin. New York M. J. Jan. 20, 1900.

MARIKOVSKY, G. Immunisierungs- und serotherapeutische Versuche dem Morphin gegenueber. Centralbl. f. Bakteriol., Parasitenk. u. Infektionskht. 1906–1907. Vol. 43. pp. 494–507.

MARMÉ, W. Untersuchungen zur akuten und chronischer Morphinvergiftung. Deutsche med. Wchnschr. 1883. Vol. 9. pp. 197–198.

MARQUIS, E. Ueber den Verbleib des Morphins im thierischen Organismus. Pharm. Ztschr. f. Russland. 1896. Vol. 35. pp. 549–552.

MARSHALL, O. The opium habit in Michigan. Annual Report. Michigan State Board of Health. 1878. Vol. 6. pp. 61–73.

MARTIN, ERNEST. L'opium, ses abus, mangeurs et fumeurs d'opium, morphinomanes. Paris. 1893.

MARTINSON, I. J. Some experiences with heroin. Med. Times. 1901.

MATTISON, J. B. The modern and humane treatment of the morphine disease. Med. Rec. 1893. Vol. 44. pp. 804–806.

MAVROJANNIS. Études sur le mécanisme de l'accoutumance à la morphine. Compt. rend. hébd. des séances et mémoires de la Soc. de biol. 1902. pp. 930–932.

MEYER, E. Ueber Morphinismus, Kokainismus und den Missbrauch anderer Narkotika. Med. Klin. 1924. Vol. 20. pp. 403–407.

MIGNARD, M. Psychologie et psychothérapie des toxicomanes. Bull. Méd. 1924. Vol. 38. pp. 1190–1203.

MILLER, G. H. and O. H. PLANT. Effect of morphine and some other opium alkaloids on the muscular activity of the alimentary canal. II. Influence of continued administration of morphine and of withdrawal on the contractions of small intestines of dogs. J. Pharm. & Exper. Therapeutics. Aug. 1926. Vol. 28. No. 2. pp. 241–249.

MINISTRY OF HEALTH (Great Britain). Report of Departmental Committee on Morphine and Heroin Addiction. London. 1926.

MIRTO, D. Sul significato della siero-reazione precipitante nell 'assuefazione alla morfina e sul suo valore come mezzo di riconoscimento della morfina. Arch. farm. sper. Siena. September 1905. Vol. 4. No. 9. pp. 406–418.

MONESTIER, M. *See Rogues de Fursac, J. and M. Monestier.*

MONTAGNINI, T. Riforma med. Aug. 30, 1904.

MORAT, DANIEL. Le sang et les sécrétions au cours de la morphinomanie et de la désintoxication. Thèse de Paris. 1911.

See also Sollier, P. and D. Morat; also Chartier and Morat.

MOREL-LAVELLÉE, A. Les alcaloides de l'opium, morphine, héroine, dionine. Notes pour la cure de démorphinisation. Emploi de l'héroine. Rev. de thérap. 1902. Vol. 69. pp. 109–119.

MORGENROTH, J. Zur Frage des Antimorphinserums. Berl. Klin. Wchnschr. 1903. Vol. 40. pp. 471–474.

MUSSER, JOHN H. *See Anders, James M. and John H. Musser.*

MYERS, H. B. Cross tolerance, altered susceptibility to codein, heroin, cannabis indica and chloral hydrate in dogs having an acquired tolerance for morphine. J. Pharm. & Exper. Therap. August, 1916. Vol. 8. No. 8.

NADLER, G. Ueber die Bildung des Oxymorphins bei vorsichtiger Oxydation des Morphins. Schweiz. Wchnschr. f. Pharm. 1873. Vol. 11. p. 417–419. Vol. 12. pp. 38–42.

Nation's Health. Public health aspects of drug addiction. Editorial. June 1923. Vol. 5. No. 6. pp. 366–368.

Neff, I. H. The case of the drug addict. J. Mich. M. S. March, 1921. Vol. 20. pp. 79–83.

Neligan, A. R. The opium question, with special reference to Persia. London. 1927.

New York. Preliminary Report of the Joint Legislative Committee appointed to investigate and examine the Laws in Relation to the Distribution and Sale of so-called Habit-forming Drugs. 1917.

Final Report of the Joint Legislative Committee to Investigate the Laws in Relation to the Distribution and Sale of Narcotic Drugs. State of New York No. 35. In Senate. Mar. 1, 1918.

New York Medical Society, E. D. Fisher. Report of the Committee on Narcotic Drugs. Presented at annual meeting of the Medical Society of State of New York at Albany, April, 18, 1922. N. Y. State J. Med. May, 1922. Vol. 22. No. 5. pp. 221–222.

New York Narcotic Drug Control Commission. Second Annual Report. 1920.

New York Psychiatrical Society and Public Health Committee, New York Academy of Medicine. Recommendations. Medical Record. Mar. 16, 1918.

New York State Commission of Prisons. Special Report on Drug Addiction. December 2, 1924.

Nishigishi, S. Studien ueber das Morphinismus. I. Mitteilung. Grundumsatz der Morphinisten, Opiumisten und Pantoponscopolaministen. J. Orient. Med. 1926. Vol. 5. p. 64.

Studien ueber das Morphinismus. II. Mitteilung. Blutchemie der Morphinisten. J. Orient. Med. 1926. Vol. 5. p. 69.

Nissl, F. Die Hypothese der specifischen Nervenzellenfunction. Allg. Ztschr. f. Psychiat. 1897–1898. Vol. 54. pp. 1–29.

Beiträge zur Anatomie und Histopathologie der Nervenzellen mit besonderer Berücksichtigung der pathologischen Zellenveränderungen nach experimentell erzeugten Vergiftungen. 1897–1898. Vol. 54. pp. 29–107.

Notta, M. La morphine et la morphinomanie. Arch. gén. de méd. 1884. Vol. 2. pp. 385–402; 561–583.

Obersteiner, H. Chronic morphinism. Brain. 1879–1880. II. pp. 449–465. Der chronische Morphinismus. Wien. Klinik. March, 1883. Vol. 9. pp. 61–84.

Oberteuffer, D. Preliminary report of a survey on the subject of habit-forming drugs in the New York State high schools. December 31, 1923. Feb. 9, 1924.

Oliver, F. E. The use and abuse of opium. Third Annual Report of the State Board of Health, Massachusetts. 1871.

Orbison, T. J. *See Carter, Orbison, Steele, Wright and Williams.*

Osler, W. The principles and practice of medicine. 1894.

Ottenstein, B. Tierexperimentelle Untersuchungen zum Problem der Suchten und Entziehungsercheinungen, insbesondere des Morphinismus. Arch. f. exp. Path. u. Pharm. Vol. 100. pp. 349–352.

See also Fauser, A. and B. Ottenstein.

Parrish, Joseph. The probe. 1869.

Paton, Stewart. Psychiatry. 1905.

Pearson, Charles B. Is morphine "happy dust" to the addict? Med. Council. Dec. 1918 and Jan. 1919.

A study of the etiology and prophylaxis of relapse in morphinism. Med. Rec. June 21, 1919.

A study of degeneracy as seen among addicts. New York M. J. Nov. 15, 1919.

Pellens, Mildred. *See Terry, C. E. and Mildred Pellens.*

Pellini, E. J. and A. D. Greenfield. Narcotic drug addiction. I. Formation of protective substances against morphin. Arch. Int. Med. Sep. 15, 1920. Vol. 26. No. 3. p. 279.

Pellini, Emil J. and Arthur D. Greenfield. Narcotic drug addiction. II. The presence of toxic substances in the blood serum in morphin habituation. Arch. Int. Med. May 15, 1924. Vol. 33. No. 5. pp. 547–565.

Pepper, William. System of practical medicine. Chapter on opium habit by James C. Wilson. 1886.

Pereira, J. Elements of materia medica and therapeutics. New York. 1872.

Perkins, R. G. The present situation with regard to narcotic addiction in the United States. Illinois Medical Journal, 1922. Vol. 41. p. 44–47.

Peterson, Frederick. *See Church, Archibald and Frederick Peterson.*

Pettey, George E. The narcotic drug habits and their treatment. Therap. Gaz. 1901. Vol. 17. pp. 655–662.

The heroin habit another curse. Alabama Med. Jour. 1902–3. Vol. 15.

A rational basis for the treatment of narcotic addiction. N. Y. Med. J. Nov. 5, 1910. Vol. 92. pp. 915–917.

Narcotic drug diseases and allied ailments. 1913.

Pichon, G. Le morphinisme. Paris. 1889.

Pierce, I. H. and O. H. Plant. Studies in chronic morphin poisoning in dogs. II. Changes in blood cells and hemoglobin during addiction and withdrawal. Am. J. Pharmacol. (to be published).

Studies in chronic morphin poisoning in dogs. III. Blood sugar during tolerance and withdrawal. Am. J. Pharmacol. (to be published).

Pilcher, J. D. and Torald Sollmann. The skin reaction to morphin. Arch. Int Med. April, 1924. Vol. 33. pp. 516–524.

Pilliet. Note sur les lésions histologiques de l'intoxication morphinique subaigue. Compt. rend. Soc. de biol. 1887. Vol. 4. pp. 566–588.

Plant, O. H. and I. H. Pierce. Studies in chronic morphin poisoning in dogs. I. General sysmptoms and behavior during addiction and withdrawal. Am. J. Pharmacol. (to be published).

See also Miller, G. H. and O. H. Plant; also Pierce, I. H. and O. H. Plant.

Pollak, J. Wien. klin. Wchnschr. Jan. 11 and 18, 1900.

Polstorff, Karl. Die Einwirkung des Kaliumferricyanids und anderer schwacher Oxydationsmittel auf Morfin und "das Oxymorfin Schutzenbergers." Arch. Pharm. 1880. Vol. 217. pp. 401–424.

Potter, Samuel O. L. Therapeutics, materia medica and pharmacy. 13th ed. 1917.

Prentice, Alfred C. The problem of the narcotic drug addict. J. A. M. A. June 4, 1921. Vol. 76. No. 23. pp. 1551–1556.

Price, George E. *See McIver, Joseph and George E. Price.*

Puschmann, A. Ueber Oxydimorphin und seine Wirkung auf den tierischen Organismus. Diss. Göttingen. 1895.

Ramond. *See Achard, Ch. and Ramond.*

Reach, F. Zur Kenntnis der chronischen Morphinwirkung. Ztschr. f. exper. Path. u. Therap. 1914. Vol. 16. pp. 321–326.

Reiche, A. Ueber den Einfluss einer trächtigen Hundin gegebenen Morphiumgaben auf den Hundefoetus und den saugenden Hund. Ztschr. f. Kinderh. 1912. Orig. IV. pp. 542–545.

Rhein, J. H. W. Discussion in "The Doctor and the Drug Addict." Symposium Philadelphia County Medical Society. Meeting Nov. 10, 1920. J. A. M. A. Dec. 4, 1920. Vol. 75. pp. 1589–1591.

Rogues de Fursac, J. and A. J. Rosanoff. Manual of psychiatry. 4th ed. 1916.

Rogues de Fursac, J. and M. Monestier. Un cas de codéinomanie. Ann. méd. lég. March, 1924. Vol. 4. No. 3. pp. 119–124.

Rojas, Nerio and José C. Belbey. La adrenalina en la desmorfinizacion. Semana med. 1926. Vol. 33. Part 2. pp. 705–707.

ROUBINOVITCH, J. In Ballet's Traité de pathologie mentale. 1903. p. 445.

RÖMER, C. Die Behandlung des Morphinismus. Klin. Wchnschr. 1925. Vol. 4. No. 8. pp. 364–366.

ROSANOFF, A. J. *See Rogues de Fursac, J. and A. J. Rosanoff.*

RUBIN, SOLOMON H. Drug addiction and modern methods for control. Boston M. & S. J. Nov. 30, 1916.

RÜBSAMEN, W. Experimentelle Untersuchungen ueber die Gewöhnung an Morphin. Arch. f. exper. Path. u. Pharmakol. 1908. Vol. 59. pp. 227–244.

RUNKEL, J. Ueber die Verwertung des Heroins in der Kinderpraxis. Inaug. Dissertation. Bonn. 1900.

RYND, F. Neuralgia: Introduction of fluid to the nerve. Dublin Med. Press. March 12, 1845.

Dublin Quart. Jour. Med. Sc. 1861. Vol. 32.

SAINSBURY, HARRINGTON. Drugs and the drug habit. 1909.

SAINT-MARTIN, T. Étude expérimentale des effets de l'administration répétée de l'éther diacétique de la morphine. Echo méd. de Lyon. 1900. Vol. 5. pp. 203–211.

SANDOZ, C. EDOUARD. Report on morphinism to the Municipal Court of Boston. J. Crim. Law and Criminol. May, 1922. Vol. 13. No. 1.

SARATSCHOW. Ueber die Veränderungen in den Nervenelementen des Centralnervensystems bei der Morphiumvergiftung. Abstract from Neurol. Centralbl. 1895. Vol. 14. pp. 366–367.

SATO, KYUSABURO. Ueber den Katalasengehalt des Blutes bei chronischer Morphinvergiftung. J. Orient. Med. April, 1927. Vol. 6. p. 50.

SCARBOROUGH, ELEANOR M. The influence of thyroid feeding on chronic morphine poisoning. J. Pharmacol. & Exper. Therap. June, 1926. Vol. 27. Nos. 5 & 6.

SCELETH, CHARLES E. A rational treatment of the morphine habit. J. A. M. A. March 18, 1916.

SCHEFFEL, Carl. The victims of habit-forming drugs, from a medical, sociological and legal point of view. Med.-Leg. J. March–April, 1918. Vol. 35.

The etiology of fifty cases of drug addiction. Med. Rec. Nov. 16, 1918.

SCHETTLER, O. H. *See Sollmann, Schettler and Wetzel.*

SCHMIDT, C. La guérison des maladies produites par l'abus de la morphine. Paris. 1899.

SCHNEIDER, K. Zur Frage der chronischen Morphinpsychose und des Zusammenhangs von Sinnestauschungen und Wahnideen. Ztschr. f. d. ges. Neurol. u. Psychiat. 1913. Orig. 19. pp. 25–42.

SCHOEN, R. Zur Kenntnis der Morphinwirkung beim Menschen. I. Die Veränderungen der Blutreaktion und ihre Begleiterscheinungen. Arch. f. exp. Path. u. Pharm. 1924. Vol. 101. pp. 365–382.

Zur Kenntnis der Morphinwirkung beim Menschen. II. Mitteilung: Die Veränderungen des Grundumsatzes und der Einfluss mässiger Gewöhnung auf Grundumsatz, Blutreaktion und Atmung. Arch. f. exp. Path. u. Pharm. 1924. Vol. 102. pp. 205–216.

SCHÜBEL, K. Stoffwechselversuche an Hunden während der Gewöhnung an Morphin und während des Morphinhungers. Arch. f. exp. Path. u. Pharm. 1920. Vol. 88. pp. 1–29.

SCHÜTZ, OTTO. Anatomische Befunde an Rückenmark und Nerven bei einer Morphinistin. Neurol. Centralbl. 1908. Vol. 27. pp. 157–159.

SCHUTZENBERGER, M. P. Note sur quelques produits d'oxydation de la morphine sous l'influence de l'acide azoteux. Compt. rend. Acad. d. Sc. 1858. Vol. 46. p. 598.

SCOTT, LEONARD C. The case of the drug addict. Quart. Bull. Louisiana State Board of Health. March 1923. Vol. XIV. No. 1. pp. 14–18.

SEAMAN, VALENTINE. An inaugural dissertation on opium. Philadelphia. 1792.

SHOEMAKER, JOHN V. Materia medica and therapeutics. 7th ed. 1908.

Simon, Carleton. Survey of the narcotic problem. J. A. M. A. Mar. 1, 1924. Vol. 82. No. 9. pp. 675–679.

Slocum, M. A. Morphin: its use before and after operations. J. A. M. A. April 25, 1925. Vol. 84. pp. 1264–1267.

Smith, G. H. On opium smoking among the Chinese. Lancet. 1841–42. Vol. 1. p. 707.

Smith, William G. On opium, embracing its history, chemical analysis and use and abuse as a medicine. New York. 1832.

Sollier, Paul. La démorphinisation et le traitement rationnel de la morphinomanie. Semaine méd. 1894. pp. 146–152.

La démorphinisation; mécanisme physiologique; conséquences au point de vue thérapeutique. Presse med. Apr. 23 and July 8, 1898.

Héroïne et héroïnomanie. Presse méd. Nov. 4, 1905. p. 716.

Méthode physiologique de démorphinisation rapide basée sur 357 cas de guérison. (1890–1910). J. méd. Paris, Dec. 28, 1910.

Un cas de codéinomanie pure. Rev. de med. leg. 1913. Vol. 20. pp. 359–362.

À propos de la chimiothérapie du morphinisme. Bull. gén. de thérapie. 1920. Vol. 171. pp. 325–329.

Recherches sur la viscosité sanguine dans l'intoxication morphinïque. Bull. de l'Acad. de Méd. Apr. 24, 1922. pp. 428–431.

Sollier, P. and D. Morat. De l'épreuve de l'hémoclasie digestive chez les morphinomanes au cours de l'intoxication et de la désintoxication. Presse méd. Jan. 10, 1923.

Sollmann, Torald. A manual of pharmacology. 3d ed. 1926.

Studies of chronic intoxications on albino rats. VII. Local anesthetics; morphine group; chloral. J. Pharmacol. and Exper. Therap. July, 1924. Vol. 23. No. 6. pp. 449–459.

Sollmann, Torald, O. H. Schettler and N. C. Wetzel. Studies of chronic intoxications on albino rats. I. Organization of the investigations. J. Pharmacol. & Exper. Therap. Nov. 1920. Vol. 16. No. 4. pp. 273–309.
See also Pilcher, J. D. and Torald Sollman.

Somerville, Wm. G. Who is responsible for the drug addict? Southern Med. J., Feb. 1924. pp. 108–112.

Sprague, G. P. Some essential points in the etiology, pathology and treatment of Morphine. Lancet-Clinic. 1907.

Spratt, Bishop. History of the Royal Society of London. 1667. p. 317.

Stanley, L. L. Morphinism. J. Amer. Inst. Crim. Law and Criminol. 1915–16. Vol. 6. p. 586.

Morphinism and crime. J. Amer. Inst. Crim. Law & Criminol. 1917–18. Vol. 8. pp. 749–756.

Stark, E. Untersuchungen ueber die Gewöhnung des thierischen Organismus an Gifte. Inaug. Diss. Erlangen. 1887.

Steele, E. H. *See Carter, Orbison, Steele, Wright and Williams.*

Stern-Piper, L. Die Senkungsgeschwindigkeit des Blutes bei chronischem Morphinismus und Eukodalismus. Berl. Klin. Wchnschr. 1925. Vol. 4. p. 548.

Stewart, W. B. Oklahoma Med. Jour. 1901.

Stillé, A. Therapeutics and materia medica. 1874.

Stokes, C. F. Pathology and treatment of narcotic addiction. Med. Rec. June 9, 1917. Vol. 91. p. 969.

The military, industrial and public health features of narcotic addiction. J. A. M. A. Mar. 16, 1918.

Strube, G. Mitteilung ueber therapeutische Versuche mit Heroin. Berl. klin. Wchnschr. 1898. Vol. 35. pp. 993–996.

Swaine, George D. Regarding the luminal treatment of morphine addiction. Am. J. Clin. Med. 1918. Vol. 25. pp. 610–611.

Swords, M. W. A résumé of facts and deductions obtained by the operation of a narcotic dispensary. Am. Med. Jan. 1920. p. 23.

Sysak, N. Zur Frage der pathologisch-anatomischer Veränderungen bei akuter und chronischer Morphiumvergiftung. Virchow's Archiv. f. pathol. Anatomie u. Physiologie. 1925. Vol. 254. pp. 163–173.

Takayanagi, T. Eine Methode zur quantitativen Bestimmung des Morphins in Körperflüssigkeiten und Organen. Arch. f. exper. Path. u. Pharm. 1924. Vol. 102. pp. 167–175.

Ueber das Schicksal des Morphins im Tierkörper. II. Mittwilung: Ueber die Zerstörung des Morphins im Tierkörper. II. Mitteilung: Ueber die Zerstörung des Morphins im Körper gewöhnter und ungewöhnter Ratten. Arch. f. exper. Path. u. Pharm. 1924. Vol. 102. pp. 183–187.

Tatum, A. L. *See Collins, K. H. and A. L. Tatum.*

Terry, C. E. Annual Report. Board of Health. Jacksonville, Fla. 1913.

To the Committee on Drug Addictions. A further study and report on the use of narcotics under the provisions of federal law in six communities in the United States of America, for the period July 1, 1923, to June 30, 1924. New York, 1927.

Terry, C. E. and Mildred Pellens. To the Committee on Drug Addictions. Preliminary report on studies of the use of narcotics under the provisions of federal law in six communities in the United States of America for the period July 1, 1923, to June 30, 1924. New York, November, 1924.

Teruuchi, Yutaka and Sotaro Kai. Fate of morphin in animal body. J. Pharmacol. & Exper. Ther. 1927. Vol. 31. pp. 177–199.

Theophrastus. De historia plantorum. IX. 82.

Thompson, William Gilman. Text-book of practical medicine. 2nd ed. 1902.

Tilney, Frederick. *See Lambert, Alexander and Frederick Tilney.*

Tompkins, E. D. *See Brown, S. H. and E. D. Tompkins.*

Toth, L. Bemerkungen zur Erklärung der chronischen Morphiumintoxikation. Schmidt's Jahrb. 1891. Vol. 229. p. 135.

von Tschisch, W. Ueber Veränderungen des Rückenmarkes bei Vergiftung mit Morphium, Atropin, Silbernitrat und Kaliumbromid. Virchow's Archiv. 1885. Vol. 100. pp. 147–176.

Turnauer, B. Ueber Heroins Wirkung. Wien. med. Presse. 1899. Vol. 40. No. 12.

Tyson, James. Practice of medicine. 1900.

Tyson, James and M. Howard Fussell. Practice of medicine. 1913.

United States. Foreign relations. Letter to Sir Edward Grey, Oct. 17, 1906. China. 1908. No. 1.

Foreign relations. Letter to American delegates to Third International Opium Conference. 1914.

Opium Problem. Message from the President of the United States transmitting. . . . a report of the International Opium Commission. Senate Doc. No. 377. 61st Cong. 2nd Sess.

Suppression of the abuse of opium and other drugs. Convention and Final Protocol between the United States and other Powers. Treaty Series No. 612. Washington: 1922.

Report by the Government of the United States of America on the traffic in opium and other dangerous drugs for the year ended June 30, 1926.

Report by the Government of the United States of America on the traffic in opium and other dangerous drugs for the year ended June 30, 1927.

House of Representatives—Letter from Secretary Fairchild to Speaker. Jan. 12, 1888. Ex. Doc. No. 79. House of Representatives. 50th Congress. First Session.

House of Representatives—Importation and Use of Opium. Hearing before the Committee on Ways and Means. 61st Cong. 2nd Sess. May 31, 1910.

House of Representatives—Limiting the production of Habit-forming narcotic drugs and the raw materials from which they are made. H. R. Report No. 1678. 67th Cong. 4 Sess.

Senate—Second International Opium Conference. Senate Doc. 733. 62nd Cong. 2nd Sess.

Senate. Second International Conference. Senate Doc. No. 157. 63rd Cong. 1st Sess.

Supreme Court—C. O. Linder vs. The United States of America. On Writ of certiorari to the U. S. Circuit Court of Appeals for the Ninth District. No. 183. October Term. 1924 (April 13, 1925).

Treasury Department—Traffic in Narcotic Drugs. Report of Special Committee of Investigation appointed March 25, 1918 by the Secretary of the Treasury. Washington: 1919.

VALENTI, ADRIANO. Experimentelle Untersuchungen ueber den chronischen Morphinismus; Kreislaufstörungen hervorgerufen durch das Serum morphinistischer Tiere in der Abstinenzperiode. Arch. f. exper. Path. u. Pharm. Mar. 5, 1914. Vol. 75. pp. 437–462.

Nuove richerche sul morfinismo. cronico; l'azione del siero di sangue dei cani morfinizzati e astinenti sui vasi sanguigni. Nota riassuntiva. Boll. d. Soc. med. di Parma. 1922. 2s. Vol. XV. p. 267.

Sulle cause dei disturbi dell'astinenza morfinica nei morfinisti. Gazz. internaz. med.-chir. 1923. Vol. 28. pp. 217–218.

VAN KLEEK, L. A. Symptoms of morphine withdrawal in an infant. Am. Med. Jan. 1920. pp. 51–52.

VAQUEZ, H. Des méthodes propres à évaluer la résistance des globules du sang. Comptes rendus de la Soc. de Biol. Feb. 5, 1898. p. 159. Also Semaine méd., 1898, p. 611.

VIGUER, EDOUARD. Contribution a l'étude de la démorphinisation. 1903.

VINNEDGE, W. W. The ethics and legislation of drug and alcohol addiction. Med.-Leg. J. May, 1916. Vol. 33.

VIRGIL. Aenead. Lib. IV. v. 486.
Georgics. Lib. I. v. 78.

WATSON, WILLIAM T. Is codein a habit-forming drug? J. A. M. A. May 13, 1922. Vol. 78 (2) No. 19. pp. 1478–1479.

WEIMANN, W. Zur pathologischen Anatomie der akuten und chronischen Morphiumvergiftung. Deutsche Ztschr. f. d. ges. gerichtl. Medizin. 1926. Vol. 8. pp. 205–220.

WEISS, J. Heroin ein neues Substituens des Morphins. Heilkunde. 1898. Vol. 3. pp. 12–14.

WETZEL, N. C. *See Sollmann, Schettler and Wetzel.*

WHITE, WILLIAM A. Outlines of psychiatry. 6th ed. 1918.

WHITE, W. HALE. Materia medica, pharmacy, pharmacology and therapeutics. London. 1918.

Materia medica, pharmacy. pharmacology and therapeutics. 1924.

WHITTA, SIR WILLIAM. Practice and theory of medicine. 1908.

WHOLEY, C. C. Morphinism in some of its less commonly noted aspects. J. A. M. A. Vol. 58. No. 24. June 15, 1912. pp. 1855–1856.

Inadequacy of Bishop's antitoxin hypothesis to explain fully the symptomatology in morphin addiction. J. A. M. A. Mar. 1, 1913. Vol. 60. No. 9. p. 688.

Psychopathologic phases observable in individuals using narcotic drugs in excess. Penn. Med. J. June 1913. Vol. 4. pp. 721–725.

The mental and nervous side of addiction to narcotic drugs. J. A. M. A. Aug. 2, 1924. Vol. 83. pp. 321–324.

Wierzbicki, S. Klinische Beobachtungen ueber den therapeutischen Wert des Heroins. Klin. therap. Wchsnchr. July 2, 1899.

Wiesner, J. Heroin in surgical practice. Internat. J. Surg. 1900. Vol. 13.

Wilcox, Reynold Webb. Materia medica and therapeutics. Philadelphia. 1917.

Willcox, Sir William H. Norman Kerr Memorial Lecture on Drug Addiction. Brit. M. J. Dec. 1, 1923, No. 3283. pp. 1013–1018.

Williams, Edward H. Some observations on the narcotic situation. Med. Rec. 1921. Vol. 100. pp. 140–143.

Opiate addiction: its handling and treatment. New York. 1922.
See also Carter, Orbison, Steele, Wright and Williams.

Wilson, J. C. and A. A. Eshner. American textbook of applied therapeutics. 1896.

Witthauer, K. Erfahrungen ueber Heroinum muriaticum. Heilkunde. 1900. Vol. 4. p. 267–268.

Wood, Alexander. New method of treating neuralgia by the direct application of opiates to painful spots. Edinburgh Med. and Surg. Jour. 1855. Vol. 82. p. 265.

Wood, George B. A treatise on therapeutics and pharmacology or materia medica. 1856.

Wood, G. W. Cincinnati Lancet-Clinic. Nov. 16, 1901.

Wood, Horatio C. Jr. The newer substitutes for morphine, peronine, dionine, heroin. Merck's Arch. 1899.

Some of the results of the Harrison Anti-Narcotic Law. J. Am. Pharm. Assn. 1916. Vol. 5.

Wright, C. A. *See Carter, Orbison, Steele, Wright and Williams.*

Wright, Hamilton. The International Opium Commission. Am. J. Internat. Law. July and October, 1909.

The International Opium Conference. Am. J. Internat. Law. Oct. 1912 and Jan. 1913.

Wuth, O. Ueber Morphinismus. I. Die Entstehung der Krankheitserscheinungen. Münch. med. Wchnsch. Oct. 12, 1923. Vol. 70. No. 41. pp. 1266–1268.

Ueber Morphinismus. II. Bemerkungen zur Therapie. München. med. Wchnschr. July 4, 1924. Vol. 71. p. 893–894.

Zambaco, D. A. Contribution a l'étude de la morphinomanie. Encéphale. 1884. Vol. 4. p. 658–683.

INDEX

A

Abdominal distress, 441, 449, 457, 458, 622
Aboulia, 447, 448, 456, 506
Abscesses, in addiction, 222, 238, 250, 252, 432
  in withdrawal, 204
Abstinence,—*see* Withdrawal; Symptomatology, withdrawal symptoms
Accessory organs, effect on, 278, 602
Achard, Ch., 193-195
Acidosis, in addiction, 233, 234, 539
Act of 1909, smoking opium, 749
Acute opium intoxication, 177, 250-252, 254, 266, 283, 292-297
Adalin, 578
Adams, Samuel Hopkins, 75-76, 88, 89
Addiction, abscesses in, 222, 238, 250, 252, 432
  acidosis in, 233
  adaptation to account for, 384
  a disease, 138, 139, 140, 141, 143, 145, 147, 149, 151, 153, 164, 885
  adrenals in, 224, 278
  a functional poisoning, 148
  a habit, 140, 142, 143, 146, 149, 150, 151, 153
  among physicians, 98, 106, 112, 113-114, 116, 118, 123, 127, 130, 245, 489, 492, 496, 497, 511
  an accident, 885
  a psychosis, 140 et seq., 150
  antidotal substance theory, 324 et seq.
  causes of,—*see* Etiological factors
  character changes in, 231, 237, 375
  chemical aspects of, 373, 403
  compared with benign habits, 231
  congenital, 163, 410-428
  definitions of, 161, 262, 384, 819, 906-907
  economic loss through, 888
  effect of, on industrial efficiency, 248
  effects on personality, 214, 215, 232, 374-377, 505-507
  extent of,—*see Extent*
  economic loss through, 888
  following alcoholism, 130

Addiction—(*Continued*)
  juvenile, 61, 95, 96, 112, 117, 123, 479, 480-482, 886, 888
  late effects of, 237
  length of, in relation to withdrawal symptoms, 464
  mechanism of, 214 et seq., 232, 321, 384 et seq., 601 et seq.
  medical, 96 et seq., 110, 116 et seq.
  menace of, to civilization, 907
  mental effects of, 138, 139, 166 et seq., 174, 190 et seq., 441, 447-448, 450, 452, 455, 456, 459, 460
  mixed, 107, 389, 514, 541, 542, 568, 921
  nature of, 136-165
  nervous exhaustion an inseparable antecedent, 144
  not a degeneration, 886
  not hereditary, 148
  prevalence of, relative to size of communities, 17
  reasons for, given by addicts, 97, 124, 240-243
  regarded as a vice, 139, 140, 142, 145, 148, 154, 155, 158
  specificity of, 270
  therapeutic, 94 et seq., 110 et seq., 129, 502, 528, 916
  thyroid deficiency in, 377-381
  unstable individuals improved by, 244
  will-power in, 447, 448, 456, 506
Addicts, classifications of, 156, 469, 474, 487, 511
  criminal, in psychopathic ranks, 244, 509-510
  cured, probation system for, 888
  defined by law, 840
  exploitation of, 877, 885, 913
  farm colonies for, 883, 886, 895, 914
  intelligence quotient of, 510 et seq.
  nervously stable, 241-243, 248-249
  numerical estimates of, U.S.,—*see* Extent
  percentage of, 911
  police attitude toward, 834
  provisions for, under state laws, 9, 977
  psychopathic, 241-243, 509-510, 621

Addicts—(*Continued*)
    registration of, 27, 34, 35, 42, 819, 832, 842
    sex distribution among, 11-12, 96-97, 469-475, 484, 863
    social misfits among, 888 et seq.
    stable types more amenable to law, 616
    suggestions for dealing with, 877-928
Adrenalin, 278, 596
Adrenals, 224, 251, 252, 278, 394
Advisory Committee on Traffic in Opium,—*see* International control, League of Nations
Aetius, 55
Age, 43, 123, 474-485, 852, 859, 861-863
Aggressins, power of cocain and morphin to produce, 346
Alabama, 31, 820-821, 969 et seq.
Alaska, 31
Albanese, M., 344-346
Albania, 660, 687, 737
Albuminuria, 167, 202, 203, 238, 434, 445-446, 453
Alcoholism, addiction following, 130
    comparison with, 185, 189, 191-196, 215, 386-387
    similarity of causes, 494
Alexander, A., 318
Alfalfa protein, treatment, 614-615
Aliphatics, 304
Allbutt, Thomas C., 67-68, 186, 414-415, 441-442, 471, 488-489
Allegany County survey, 795-797
Alypin, 810
Ambulatory treatment, condemned, 545, 758, 885, 886, 888, 890
    upheld, 770
Amenorrhea, 167, 459, 460
Amentia, 186, 187, 188, 191
American Medical Association, 84, 89, 155, 313, 502, 887, 893
American Medicine, 887, 885
American Opium Commission, 745
American Pharmaceutical Association, 23, 105
American Public Health Association, 504, 897
American Textbook of Applied Therapeutics, 104, 141, 174
Amnesia, 138, 184, 215, 447, 450, 452, 459
Amylene hydrate, 271
Amyloidosis, 252-253
Anders, James M., 122-123, 215-216
Andromachus, 57
Anemia, 283, 443, 448, 450, 462
Anhalonium, 810, 969-970
Animal behavior, 256, 265-277, 278, 279-282, 435, 462-467
Anselmino, 692
Antidotal substance in blood, 164, 216, 324, 325-330, 331-335, 336, 337-339, 340-342, 344-346, 363-372, 395
Antipyrine, 581
Anuria, in withdrawal, 439, 446
Apocodein, 58
Apomorphin, exemption of, 313, 893, 970-971
    not a narcotic, 702, 893
    quantity used, 796
Arabian influence, 56
Argentina, 647, 649, 650, 657, 660, 687, 935
Argentina, G., 339
Arizona, 7, 31, 815, 819, 969 et seq.
Arkansas, 31, 809, 969 et seq.
Army and navy, use of opium in, 5, 8, 23, 24, 67, 69, 92, 120, 484, 512
Aron, Max, 258-259
Arsenic, 385
Associations, causal, 41, 110, 115-117, 120, 122, 123, 127, 131, 474
Assyrian Herbal, 54
Asthma, 108, 460
Ataxic symptoms, 193
Atrophy of tissues, 254
Atropin, allergic reaction to, 225
    in withdrawal, 537, 538, 546, 605
    tolerance to, nonexistent, 324
Atwood, C. E., 84
Auditory illusions, 188
Australia, 660, 665
Austria, 659, 660, 703
Austria-Hungary, 629, 632, 647, 648, 650, 935
Autointoxication, 216-217, 449, 450, 451, 549
Autopsy findings, 171, 172, 177, 186, 192, 250 et seq., 283, 285, 287 et seq., 297 et seq.
    see also Histologic findings
Average dose, daily, computation of, 43
    speculative nature of, 4
Averroes, 56
Avicenna, 56
Ayer's Cherry Pectoral, 96

B

Babel, A., 314, 387
Babylonians, 54
Ball, B., 171-172, 536-540
Barbacci, Ottone, 179

Barbosa, 56
Barker, Fordyce, 66
Bartholow, R., 104
Bastedo, Walter A., 317, 420, 568-569
Baumm, F., 318
Beates, Henry, Jr., 213-214
Behier, 66
Belbey, José C., 596-597
Bele, B., 66
Belgium, 647, 649, 650, 655, 657, 659, 660, 935
Belgrano, C. R., 346-347
Bell, F. McK., 146, 205, 447-8
Belladonna, 346, 537, 555-557, 559, 563, 565, 578, 579
Bénard, H., 193-195
Berberine sulphate, 597
Berri, G. C., 346-347
Biberfeld, J., 213, 277, 318, 356-357, 571-572
Bibliography, 997-1014
Binet tests on addicts, 495, 511
Bishop, Ernest S., 125, 152, 156-157, 216-218, 372-373, 422, 449, 503-504, 559-564
Bladder, urinary, 283, 290, 393
Blair, Thos. S., 313, 497, 896
Blair, William, 62-63
Bloch, Hon, Maurice, 151-152, 825-831, 832-835
Block, S., 492-493
Bloedorn, W. A., 116-117, 152-153, 477, 494-495, 879-881
Blood, acidosis of, 233, 234
  antidotal substance in, 364
  calcium and potassium concentration of, 302
  catalase content of, 305
  cells, 182, 193-195, 198, 199, 201, 222, 307 et seq., 347, 541, 612
    see also Leukocytes
  changes,
    in addiction, 193-195, 198, 199, 233
    in withdrawal, 199, et seq., 221, et seq., 541, 612
  chemical analysis of, 260, 368
  coagulation during withdrawal, 199
  hemoclastic crisis, 222-223
  hemoglobin in, 200, 307-310
  pressure, 186, 351 et seq., 366-371, 416, 434, 451, 452, 460, 605
  reduced resistance of, 183
  sedimentation of, 239-240
  sugar, 227, 307-311, 612
  tests for specific toxin in, 365
  viscosity of, 221
Blue, Rupert, Ass't Surgeon-General, 683
Bógolow, T. M., 597-598
Boldin, 577
Bolivia, 647, 649, 650, 660, 682, 739, 935
Bonnar, 66
Boston, 8
Bougrier, L., 79
Boulogne, Sanatorium of, statistics of 541
Bouma, J., 314, 387
Boylan, Hon. John J., 152, 824-831, 835
Boylan Law, 824-831
Brain, 171 et seq., 192, 213, 215, 253, 254, 284, 285, 286, 290 et seq., 299, 335, 386, 395, 404
    see also Pathology; Central nervous system; Symptomatology; Psychic effects
Brauchli, E., 302-305
Braunlich, A. R., 853
Brazil, 647, 649, 650, 657, 659, 660, 935
Brennan, Hon. George R., 151-152, 825-831, 832-835
Brent, Bishop Charles H., 631-635, 636-646, 683
British Empire, 660, 681-682, 938, 943
    see also Great Britain
Bromides, 525, 536, 548, 554, 558, 576, 578, 581, 597
Brown, Lucius P., 27-28, 113, 471, 476
Brown, S. H., 80, 81
Bryce, P. H., 897
Bucher, W. H., 872-875
Buckley, A. C., 215
Bulgaria, 647, 648, 650, 659, 660, 935
Bureau (author), 413
Burkart, R., 534-536
Burr, C. B., 115-116
Butler, G. F., 143, 558-559
Butler, W. P., 37-40, 158, 863-872
Buvat, J. B., 82

C

Cachexia, 167, 293, 457
Caddo Parish survey, 37-41, 863-872
Caffein, 553
California, 7, 31, 91, 809, 815, 821, 969 et seq.
Calkins, Alonzo, 5-6, 63, 69, 138, 167, 469, 487-488, 518-519
Camp Upton, New York, 120
Campbell, 692
Camphor oil, 577
Canada, 23, 31, 632, 639, 660, 672, 676

Cannabis indica—*see also* Indian hemp
  cross-tolerance to, 517
  in withdrawal, 522
  international control of, 636, 645, 693, 946, 948
  sales of, 22
  state control of, 810-816, 969-970
Carcinoma not an etiological factor, 216
Cardialgia, 433
Caries of teeth, 453
Carlisle, F. H., 495
Carter, C. W., 143, 490
Carter, John P., 876
Carter, M. G., 613-615
Case, C. L., 145, 196
Castor oil, 554
Catalase, 305
Causes—*see* Etiological factors
Celsus, 56
Cenesthesia, 229
Center, C. D., 81
Central nervous system, 167 et seq., 173 et seq., 177 et seq., 179 et seq., 192, 193, 195, 254, 279-287, 290-292, 295, 297-302, 373
  see also Pathology; Symptomatology; Brain
Certificate system, 638, 639, 641, 673, 674, 687-688, 689, 694-697, 699-700, 737, 742
Character, effect on, 138, 175, 184, 185, 186, 205, 210, 211, 214-215, 228, 231-232, 237, 244 et seq., 375, 452
Chartier, M., 196
Chemistry of opium, 346, 359, 382, 789
Chicago, 16, 31, 97
Children, addiction in—*see* Addiction, congenital; Addiction, juvenile
  sale of drug to, 112, 939
Chile, 647, 649, 650, 657, 658, 660, 935
China, 56, 629-634, 635, 638, 639, 640, 642, 647, 650, 651, 655-660, 663, 664, 666, 667, 668, 669, 680, 684, 685, 688, 689, 707, 735, 739, 741, 929, 934-935, 938
Chloral hydrate, 22, 317, 554, 969-970
Chlorodyne, 122
Choice of drug, 484
Cholagogues, 576
Cholesterin, 357
Cholin, action of, 382, 383, 595
Choreic movements of extremities, 441, 458, 464, 573
Chotzen, F., 186-192
Chronic opium intoxication—*see also* Symptomatology; Pathology; Addiction; Morphinism; *and under names of individual organs*
Chronic opium intoxication—(*Cont.*)
  characteristics of, 216-218, 220, 312, 374-377
  chemical aspects of, 373, 403
  compared with alcoholism, 185, 189, 191, 196-197, 386-387
  compared with subacute, 175
  effect of, on metabolism, 190, 216, 233-234, 259-260
  effects on personality, 232, 374-377
  for euphoric effect, 134
  hemolytic test for, 371
  increasing, 93
  mechanism of, 214, 232, 321, 384, et seq., 399
  nature of, 375 et seq.
  psychosis in, 207 et seq.
  symptoms of, 137 et seq., 429-467
  tolerance the fundamental characteristic of, 312
  vagus-sympathetic balance in, 277
Church, Archibald, 113, 455
Cinchona, 554
Circulatory system,—*see* Symptomatology; Pathology
Cities making control efforts, 876
Civil War, addiction among veterans of, 67, 69, 484
Claude, Henri, 126-127, 909-910
Clinics—*see* Narcotic clinics
Cloetta, M., 302-305, 337-338
Closing of clinics by federal narcotic agents, 865, 866, 870, 875, 876
Cobbe, William R., 104
Coca derivatives, international trade regulations, 932-934
  manufacture, 679-683
Coca, fluid extract of, 527
Coca leaves, importation of, United States, 899, 962
  international control of, 672-694
  per capita use of, 795, 798-802
  regulations of Federal Narcotic Control Board, 783 et seq.
  state laws concerning, 969-970
Cocain, addiction to, 105, 107, 127, 244, 261, 388-389
  addicts chiefly psychopaths, 676
  addicts, Jacksonville, 32
  chronic psychosis doubtful, 208
  consumption, estimate of, 796-797
  continued prescription of, condemned, 921
  dangerous in treatment of morphinism, 532
  defined, 783
  in morphin withdrawal, 531
  legislation, New York, 837-839

Cocain—(*Continued*)
  liver in addiction, 292
  more destructive than opium, 249
  ointments, 970
  patent medicines containing, 701
  quantities dispensed, Allegany survey, 796-797
  relation of, to crime, 505, 510
  sale of, 23
  sex distribution of addicts, 472
  state laws, 810-816, 969-970
  stimulating effect of, 271
  suppression of, urged, 701
  survey of, 796-797
  tolerance to, 261, 388, 389
Coco, A. V. (Judge), opinion of, 846-847
Codein, case reports, 319-321
  control of importation, 783
  controversy concerning, 313-321
  cross-tolerance to, 317
  derivatives, tolerance to, 213
  discovery of, 58
  effect of, 318, 320
  elimination, 315
  exemption recommended, 893
  fate of, in body, 361
  frequency of addiction to, 316
  habit, 318, 320
  how obtained, 793-794
  indestructible by organism, 314
  not a habit-forming drug, 317, 318, 320
  per capita use, 796-798
  state laws concerning, 969-970
  substitution in morphin withdrawal, 313, 319, 525-526, 537
  survey of quantities used, 796-797
  tolerance to, 314, 317
  withdrawal symptoms, 312, 315
Cohen, J., 120, 498
Cold packs, 554
Collapse, in withdrawal, 146, 159, 165, 431, 434, 442, 443, 449, 454, 455, 457 et seq., 524, 525, 566, 568, 621
Collins, Cornelius F. (Judge), 478, 826, 855-864
Collins, K. H., 249-250
Collins, Sir William, 648
Colombia, 647, 649, 650, 660, 687, 935
Colorado, 31, 810, 815, 821, 969 et seq.
Comar, G., 82
Comium, 558
Committee on Drug Addictions,
  codein addiction, case reports, 320-321
  organization and scope of Committee, xii et seq.
Committee on Drug Addictions—(*Continued*)
  per capita use, opium and coca leaves, studies on, 798-802
Committee on Narcotic Drug Situation in U. S., 887-890
Conference of State and Provincial Health Authorities of North America, 897-901
Connecticut, 7, 31, 821, 969 et seq.
Constipation, 138, 230, 435, 449, 453, 455, 459, 463 et seq.
Consumption, China, 95, 122, 631-633, 635, 639, 640, 666, 685-686, 688
  importation figures inaccurate, 2
  importations for, in U. S., 44
  in form of "cures," 7
  in rural districts, 6
  in towns and cities, 8
  increase of, in ratio to population, 5
  India, 122, 635, 665, 685, 718
  legitimate requirements, 3, 673 et seq., 693, 697-699, 702 et seq., 787-795, 795-797, 798-803, 803-804, 804-806
  therapeutic,
    Belgium, 705
    British Empire, 706
    Canada, 677
    Denmark, 677, 703-704
    England, 703
    Germany, 677, 705, 706
    Luxembourg, 677
    Sweden, 677, 703
    Switzerland, 677, 703, 705, 706
    United States, 677, 679, 796-806
Contracting Powers to Hague Convention, 929-937
Control,
  international, — *see* International control
  miscellaneous suggestions, 877-928
    abolition of heroin manufacture, 880
    after-care, provisions for, 879, 914
    "bureaus" for care of addicts, 922
    cocain in solution form only, 921
    compulsory commitment to institution, 910-911
    compulsory reporting, 887
    control, a police function, 900, 903

Control—(*Continued*)
  Miscellaneous suggestions—(*Continued*)
    control of "exploiting" institutions, 885
    cooperation of social agencies, 887
    co-operative war on illicit traffic, 907
    correction of predisposing causes, 879
    dogmatism unscientific, 927
    duplicate prescriptions, 887
    educational campaigns, 707, 853, 884, 885, 886, 897, 898, 911, 913
    elasticity of administration essential, 926
    exemption of apomorphin, 893
    farm colonies, 883, 886, 895, 914
    forbid heroin manufacture or importation, 911
    governmental appropriation for study, 885
    health department should control, 900, 901
    hospital facilities, adequate, 881, 895, 913, 914
    industrial reformatory, 902
    intellectual approach to problem necessary, 928
    international limitation of sale, 903
    long imprisonment for bootleggers, 911-913
    medical prophylaxis, 882
    mental hygiene dispensaries, 909
    model state law, 894-895, 904
    modification of laws, 891, 898
    more liberal legislation, 884
    more stringent laws, 893, 902
    official prescription blanks, 920
    organized medical research, 895, 897, 927
    participation of insurance companies, 924
    policing of harbors, 902
    psycho-analysis, 889
    raw products at source, 909
    re-opening of clinics, 892
    restriction of cultivation, 911
    restriction of deceptive advertisements, 922-924
    restriction of imports opposed by medical profession, 896
    revocation of licenses for law violation, 904

Control—(*Continued*)
  Miscellaneous suggestions—(*Continued*)
    segregation of types of addicts, 888, 897
    separation of narcotics from prohibition enforcement, 898
    social misfits, guidance of, 888
    special enforcement commissioner, 894
    state regulation, 913
    state sanatoria, 911
    subsidization of research, 912, 915
    suppression of peddlers, 913
    tolerance necessary in choosing a system, 926
    uniform state laws, 894
    vocational training, 887-888
  municipal—*see* Municipal control
  state—*see* Legislation, state
  United States—*see* Legislation, United States
Convalescence, 590-591
Coördination of State institutions, 914
Copeland, Hon. Royal S., 850 et seq.
Cortex, cerebral—*see* Brain
Coryza, 431, 460
Costa Rica, 647, 649, 650, 660, 687, 935
Cough mixtures, 5, 7, 878
Courty, 66
Cox, J. W., 320-321
Craig, M., 472
Cramps in extremities, 315, 319, 461, 465 et seq.
Craving for opium, analyzed, 602
  a physical condition, 196
  a toxemia, 146
  most important symptom in addiction, 601
  nature of, 137-165
  result of nervous constitution, 139
Creutzfeldt, H. G., 296-300
Crim, J. W. H., 901-902
Crime, effect of drug regulation upon, 859
  in relation to psychopathic addicts, 505 et seq., 509-510
  increased by closing of clinics, 870
  relation of, to addiction, 237, 244, 494, 505, 508-510, 858, 901-902
Criminal addicts—*see* Addicts, criminal
Cross-tolerance, 314, 317
  effect of, on heroin addiction, 485
  to chloral hydrate, 317
Crothers, T. D., 69, 150
Crowdy, Dame Rachel, 959

Crude opium,
    defined, by Federal Narcotics Control Board, 783-784
        by Hague Opium Convention, 930
Crumbine, S. J., 901
Cryptopin, 58
Cuba, 647, 649, 650, 660, 935
Culbreth, D. M. R., 7
Cullen, 59
Cultivation, coca, 679-683
    opium, 665-669, 679-683, 683-688
        see also Production
"Cures," advertising of, 885
    narcotic patent medicines, 878
    nostrums, an influence toward addiction, 96
    relation of medical profession to, 88
    simply substitutes, 89
    used in New England, 7
Cushny, A. R., 317, 458-459
Czecho-Slovakia, 660, 661

D

Daly, J. R. L., 80
Dana, C. L., 154, 214, 495, 884
David, Erich, 225-228, 590-595, 603-604
Day, Horace, 5, 520-521
Deafness, unilateral, 208
Death, 146, 449, 454, 455
    in morphinism, a brain death, 290
Deering, B. T., 141
Delano, Frederick A., 729-734
Delaware, 31, 816, 821, 969 et seq.
Delevingne, Sir Malcolm, 687
Delirium, 185, 187, 234-237, 431, 443
Delirium tremens, 185, 196, 433, 518
Dementia praecox, 208
Demorphinization—*see* Withdrawal
Denby, Charles, 653, 654-656
Denmark, 647, 649, 650, 655, 657, 659, 661, 676, 677, 703, 935
Densten, J. C., 883-884
Dependence, in congenital addiction, 410-425
    mechanism of, 401
    relation to tolerance, 312
De Quincey, 49, 62, 63, 64, 92, 95, 100, 101, 458
Dercum, F. X., 117, 458, 494, 567-568
Deterioration, mechanism of, 246, 261 et seq., 375
    mental and moral, 147, 215, 244 et seq.
Devay, F., 435-436
Diacetylmorphin,—*see* Heroin
Diarrhea, 319, 326, 327, 443, 444, 448, 450, 454, 457, 458, 459, 524
Diascordium, 57, 483
Dicodid, 273-275, 277
Digestive system—*see Symptomatology; Pathology; and under names of organs*
Digest of editorial literature on Harrison Narcotic Law, 993 et seq.
Digitalis, 546, 547, 553, 558, 576, 578
Dilaudid, 272-275, 277
Diner, Jacob, 118-119
Dionin, a habit-forming drug, 82
    not a drug of addiction, 387, 702
    per capita use, 796-798
    quantities dispensed, 796-797
    use of, in withdrawal, 318, 319, 538, 542
Dioscorides, 56
Diplopia, 393, 432, 433
Dispensaries—*see* Narcotic Clinics,
Distribution—*see also* Age, Sex, etc.
    age, 43, 123, 474-485, 852, 859, 861-863
    character, 494 *et seq.*
    constitution, 488 *et seq.*
    drug used, 485-487
    mentality, 495-500
    race, 25, 26
    sex, 11-12, 61, 96-97, 469-475, 484, 863
    social status, 497 et seq.
District of Columbia, 31, 969 et seq.
Doering, Michael, 55
Dominican Republic, 647, 649, 650, 657, 658, 737, 935
Dominick, H., 212
van Dongen, K., 212-213, 281, 354-6
Dorlencourt, H., 349
Dosage, increasing, required, 141, 164
    reduction of, in withdrawal, 521, 532, 533, 535, 539, 560-562, 566, 568-570, 571, 575
Dose, average daily, estimates of, 15, 43, 837
    speculative nature of, 4
Dougherty, R. P., 54-55
Douglas, C. J., 109-110
Dover's powder, 17, 22, 483, 969-970
Dowling, Oscar, 897
Dreser, H., 76, 77, 78
"Drug balance", 430, 561, 562, 563, 873
Duhem, P., 82, 84
DuMez, A. G., 41-43, 51, 322, 362, 410, 795-797, 801-802
Dupouy, M. Roget, 108, 572-577
Dyspnoea, 381, 390, 432, 433, 443, 453
Dysthymia, 184

E

Earle, C. W., 16, 97-98, 139-140, 470, 475, 527-528
Earle, F. B., 411-412
East India Company, 5
Eberle, E. G., 23-24, 105-107
Ebers Papyri, 55
Ecgonine, 946
Ecuador, 647, 649, 650, 657, 658, 659, 935
van Egmond, A. A. J., 205-206, 281, 348
Egyptians, ancient, 55
Einhorn, M., 80
Electrocardiographic studies, 365-371
Elimination, diarrhea essential in detoxication, 542
  importance of, 549
Eliminatory crises, 315, 329, 439, 540
Elmira, study of legitimate needs, 802
El Paso, Tex., per capita use, 802
Emaciation, 216, 453
Emerson, Haven, 313, 896
Endocrine extracts, 615
Endocrine system, 169, 224, 228, 230-231, 232, 239, 249, 251, 254, 255, 278, 290, 315, 326-329, 380, 392 et seq., 436, 443, 461, 593, 602 et seq., 614, 615
  see also Symptomatology; Pathology; Glandular system
England—*see* Great Britain
Eosinophiles, 199, 201, 541
Epigastric pain, 449, 457, 458, 523, 524, 545
Ergot, 554, 810
Erlenmeyer, A., 66, 530-533, 600-609
Erzer, 292
Eserine, 277, 278
Eshner, A. A., 104-105, 174-175, 414
Esters, morphin,
  addiction to, 320
  state control of, 969
Esthonia, 661, 737
Ethiopia, 737
Etiological factors, accidental, 113, 132
  associations, 39, 41, 111, 112, 114-116, 117, 120, 122, 123, 124, 127, 131, 474
  chronic disease, 98, 100, 109, 119, 121, 122, 132
  climate, 122
  closure of legitimate channels, 119, 890
  constitutional make-up, 48, 102, 103, 108, 121, 125, 126, 139, 148, 190, 215, 240, 248-249, 488 et seq., 583-584, 596, 891

Etiological factors—(*Continued*)
  country, 122
  curiosity, 100, 108, 116, 122, 123, 133
  desire for stimulation, 122
  emotional instability, 108, 125-127, 583-584
  euphoria, craving for, 97, 98, 101, 103, 456
  habits of luxury, 102, 123
  hypodermic use, 49, 64-74, 94-104, 106, 108. 110, 111, 483
  imprisonment, 508
  insomnia, 102, 105, 107, 112, 115, 117, 122, 133, 190
  labor conditions, 123, 124, 487
  memory associations, 624-626
  mental depression, 116, 118, 119, 122, 127, 128
  moral inertia, 146, 488
  nationality, 122
  nervous strain, 106, 113-114, 144, 539
  neuropathic diathesis, 118, 121, 125, 126, 141, 142, 617
  overwork, 111, 116, 122, 123, 133
  pain, 97 et seq., 100, 104, 105, 107-119, 121, 132, 133, 138, 489, 529, 530
  patent medicines, 75, 121, 122
  peddlers, 35-36, 39, 86-87
  pelvic diseases, 96, 97, 99, 474, 529
  postoperative use, 119, 122, 128, 131
  prohibition, 95, 122
  prostitutes, 94, 114, 119, 122
  psychopathic predisposition, 108, 125-129, 512, 890
  report of U. S. Treasury Dept. on, 120
  self-medication, 98, 120, 121, 132
  sensational literature, 92, 100, 105, 127
  social conditions, 106, 114, 118, 120
  soothing-syrups in infancy, 75, 95, 96, 123
  table of classification, 121
  therapeutic use, 94-110, 112, 113, 115, 116, 117, 118, 120-122, 125, 128, 133
Etiology, classification of addicts by, 110, 111, 112, 115, 121, 490
Ettinger, Alice, 265-277
Eucain, 969-970
Eukodal, 238, 239, 272, 273, 318, 387, 920
Eulenberg, 66
Eumecon, 919, 923
Euphoria, 103, 214, 240-243, 319, 375, 390, 456, 505-507, 592, 601, 623, 624
Ewing, J., 177-178

"Exempt" preparations, defined, 799
Exhaustion, nervous, in relation to addiction, 144, 539
Export licenses—*see* Certificate system
Exportation, Canada, 639
  India, 638, 690, 718
    see also Far East
  Macao, 639-640
  mutual agreement to control, 637-638, 639, 653
  smoking opium, 639, 653
  Turkey, 682, 716
  United States,
    laws, defects in early, 781
      see also Exports
Exports,
  Persia, 682, 711, 716
  regulations concerning, 638, 699
    see also Exports, Exportation, for separate countries
  revenue,
    India, 688
    Macao, 639
    Persia, 682
  United States,
    regulations, 653, 781-783, 785-786, 964
      see also Legislation, United States
Extent—*see also* Distribution
  black and white races, 26
  Chicago, 16
  data, League of Nations, 44
  druggists' responsibility for, 10
  education, effect of, on, 38
  estimates of, various, 3
  exact figures unavailable, 1
  hypodermic syringe a factor in, 9, 17, 64 et seq., 92 et seq.
  in cities, 28
  in rural communities, 28
  increase in, 5, 46
  increased by heroin discovery, 76
  Iowa, 16-17
  Jacksonville, 24-27, 47
  Los Angeles, 36
  Maryland, 318, 795-797
  Massachusetts, 18-20
  methods of determining, xiv, xv, 2, 3, 4
  Michigan, 4, 9-14, 96
  more surveys desirable, 4
  New York City, 33-35
  New York State, 36, 825
  obstacles to determining, 4
  of importations, U. S. (tables), 44, 45, 49-50
  of sales, 22
Extent—(*Continued*)
  of smuggling, 45, 46
  patent medicine industry, effect of, on, 74-75
  Pennsylvania, 43
  physicians' responsibility for, 10, 17, 96-110, 116 et seq., 120
  questionnaire, results of, 6, 17
  report of, by
    American Pharmaceutical Association, 23
    Bureau of Internal Revenue, 42-43
    Day, 5
    Eberle, 23
    Herrick, 36
    Hynson, 23
    Ludlow, 5
    Massachusetts State Board of Health, 7
    Oliver, 5
    Simon, 46
    Watson, 318
  Shreveport, 37-41
  sources of error in estimating, 1-4, 40
  summary of surveys, 42
  survey of,
    Brown, 27-29
    Bucher, 36-37
    Butler, 37-41
    DuMez, 41, 48, 795-797
    Earle, 16
    Grinnell, 21, 22
    Hartwell, 18
    Hubbard, 33-35
    Hull, 16-17
    Kolb and DuMez, 41
    Marshall, 9-14
    Narcotic Drug Control Commission, N. Y., 36
    Terry, 24-27
    U. S. Treasury Dept., 30-32
  tables of, 50-51
  Tennessee, 25, 27-29
  United States, 31, 41, 43, 47-50
  Vermont, 21, 22

F

Fairchild, C. S., 747
Fallon, Alberic, 648
Far East, 631, 632, 640, 666, 667, 684, 685, 689, 707, 708, 711, 716, 717, 738, 934-935
  see also China, India, Japan, Macao, Philippine Islands
Farm colonies, 883, 886, 895, 914

Farr, Clifford B., 113, 471, 476-477
Fate of drug in body, 172, 182, 201, 214, 306-307, 325, 326, 330, 357, 359, 360, 361, 398
Fauser, A., 401-404
Faust, E. S., 330-331
Federal Narcotics Control Board, 783 et seq., 962
Feeblemindedness in addiction, 511-513
Féré, Ch., 410-411
Ferguson, 65
Ferrai, C., 344
Fever during withdrawal, 450
Finger, Henry J., 636
Finland, 661
Floeckinger, F. C., 80
Floret, 77
Florida, 7, 31, 816, 849, 969 et seq.
Flury, 387
Form of drug used, 482 et seq., 541
France, 629, 636, 647, 649, 650, 655, 657, 660, 661, 667, 676, 684, 690, 929, 938
Francois, 689
Fränkel, Fritz, 261-265, 919-924
Free ports and zones, control of trade in, 675, 696, 700, 736, 739-740
French, James M., 107, 142
Fuller, S. C., 182
Fulton, H. D., 80, 899-900
Fürer, 144
Fussell, M. Howard, 109

G

Gagneux, Ch., 193-195
Galen, 56
Gary, Ind., per capita use, 802
Geis, N. P., 81
Gelma, Eugène, 158-159, 258-259
Generative functions—*see* Symptomology; Sex function
Georgia, 7, 31, 969 et seq.
German Opium Statute, 919
Germany, 629, 636, 641, 647, 649, 650, 655, 657, 659, 660, 677, 684, 919, 929
Gifford, S. L., 80, 81
Gin, opium as a substitute for, 5
Gioffredi, C., 323-325
Glandular system—*see* Symptomatology; Endocrine system; Secretions
Glycogen, 251, 253
Glycosuria, 185, 238, 379
Gnoscopin, 58
Gordon, A., 151, 881-882
Gordon, Frederick T., 105-107
Government control, revenue, 639-640, 682, 688, 721 et seq.
Government monopolies, 689, 690
    see also India; Macao; Production, coca
Graefe, 66
Graham, F. C., 152
Great Britain, part played in international control, 629, 632, 635, 636, 640, 646, 647, 649, 650, 651, 652, 654, 656, 657, 659, 660, 666, 672, 683, 684, 689, 929
Great Britain, Ministry of Health,
    etiological factors, report, 131-134, 165
    treatment and prognosis, 609-611, 916-917, 917-919
Greece, 647, 648, 650, 654, 660, 661, 718, 935
Greenfield, A. D., 363-371
Grinnell, A. P., 21-23
Grossman, O., 595
Growth, influence of addiction on, 237
Grüter, M., 357-361
Guatemala, 647, 649, 650, 657, 659, 660. 661, 935
Guinard, L., 435-6
Gunn, J. A., 319, 396-398
Gwathmey, J. T., 278

H

Habituation—*see* Addiction; Morphinism; Chronic Opium Intoxication
Hague Opium Convention,—*see* International Control
Haiti, 647, 649, 650, 657, 658, 660, 661, 737, 935
Hallucinations, 184, 186, 205, 235, 432, 433, 443, 452, 459
Hamilton, J. A., 472
Handy, Hast, 59-60
Happel, T. J., 412
Hardinge, Lord, 689
Hare, Hobart, A., 150, 420, 501, 502
Harmalin, 387
Harnack, E., 79
Harrer, 138
Harris, E. Elliot, 155, 887
Harrison Narcotic Act—*see* Legislation, United States
    digest of editorial literature on, 993 et seq.
Hartwell, B. H., 18-21, 101-102, 488
Hasheesh, *see* Cannabis indica; Indian hemp
Hawaii, 31, 969 et seq.
Hayes, S. Dana, 7

Heart, 186, 205, 238, 288, 437, 443, 549-551, 605
    see also Symptomatology; Pathology
Hecht, Adolf F., 224-225
Hematology, *see* Blood
Hemoglobin, 200, 307-310
Hemosiderosis, 250, 252, 289, 294, 302
Henderson, D. K., 493
Herard, 66
Heroin,
    abolition of manufacture urged, 701, 880, 884, 890, 911
    addicts, percentage of total, 486
    age of addiction, 477, 887
    as snuff, 120, 164
    as stimulant, 316, 484
    blood tests of addicts, 195, 410
    causes of addiction, 165
    chief addiction, in New York, 131
    combined with cocain, 85
    crime, influence on, 509 et seq.
    decline in medical use of, 85, 880
    defined by Opium Conference, 946
    early opinions concerning, 76 et seq.
    fate of, in body, 348, 360, 361
    habit, gradual, 316
    illicit traffic in, 85-87, 485
    in withdrawal, 552-553
    introduction of, 76, 483
    leukocyte reaction, in addiction, 195
    medical needs, 483, 804
    more powerful than morphin, 320
    per capita use, 796-798
    quantities dispensed, 796-797
    reaction to, in morphin addiction, 356
    recovery of, 316
    relative solubility of, 360-361
    sales of, 123
    sex distribution, 471
    state legislation, summarized, 969-971
    symptoms of addiction, 77 et seq., 83 et seq.
    to cure morphinism, 485
    tolerance to, 316, 319
    underworld drug, 120, 131, 165, 483-486
    uses of, 77-81, 83 et seq.
    warnings against, 77 et seq.
Herwirsch, C., 79
Hildebrandt, F., 377-381
Hill and Oxley, 167
Hippocrates, 55
Hirschlaff, L., 331-335
Hirt, 77
Histological findings, 168-174, 178 et seq., 192, 195, 250 et seq., 277 et seq., 286-302
Historical review, of problem, 55-92
    of opium consumption, 9-15
    of traffic, 5, 53
Hitzig, E., 323
Holtkamp, A., 79
Home remedies, growth of, 88-90
Homer's Iliad, 55
Honduras, 647, 649, 650, 659, 661, 935
Horiuchi, M., 223-224
Hospitals,
    Boulogne, Sanatorium of, 541
    etiological factors, report, 115, 121
    Philadelphia General, 113
    Riverside, New York City, 570
    St. Francis, Pittsburgh, 577-579
Howlett, K. S., 420
Hubbard, S. Dana, 123-124, 473, 477-478, 499-501, 852-853, 886, 887
Hull, J. M., 16-18, 99, 470, 475-476
Hungary, 659, 660, 661
Hunt, Reid, 154-155
Hunter, Charles, 66, 67
Hyams, B., 80
Hynson, H. P., 23
Hyoscin, 536, 537, 546, 547, 563, 570, 571, 578, 580, 589
Hyoscyamus, 555, 559, 563, 578, 579
Hyperacidity, in withdrawal, 323, 326, 461, 539
Hyperaesthesias, 186, 442, 453, 550
Hyperchlorhydria, 323, 326-329, 533, 539
Hypersecretion,—*see* Secretions
Hypnotics, 270, 525, 546, 578
Hypodermic syringe, effect of introduction of, 9, 64-74, 92 et seq.
    no patient should have, 530, 545
    regulations relating to, 823, 831, 838, 843, 854, 981
    responsible for addiction, 64 et seq., 92 et seq.
    self-medication by, 530
    technique of use, 574-575
    use of alkaloids increased by, 483
Hypodermic, use, 64-74, 97, 104, 139, 574-575, 878
Hypothyroidism, 461
Hysteria, 185, 187, 436

I

Idaho, 31, 810, 816, 969 et seq.
Idiocy, 454
Iliad, 55

Illicit traffic,
  attempts to control, 700, 710-711, 738, 908, 910
  before Harrison Act, 29, 85
  by mail, suppression of, 717
  changes in extent of, 29, 45, 85
  early, 4, 746, 808
  ease of carrying on, 680
  effect on youth, 482
  encouragements to, 112, 119
  impossibility of obtaining accurate information, 2, 735
  in heroin, 85, 484, 485
  increased by legislative restrictions, 29, 85 et seq., 91, 119, 890
  influence of in causation, 86
  into China by post, 735, 739, 935
  Jacksonville, 26
  penalties suggested, 687
  reduced by clinics, 26, 39, 91, 851, 869, 870
  widespread organization of, 87, 908
Illinois, 31, 969 et seq.
Immune serum, aggressins, tests of, 346
  effect of, 339, 349, 350, 363, 365-367, 410
Import licenses,—*see* Certificate system
Importation, Canada, 639
  China,—*see* Trade regulation, China
  Japan, 631, 667
  responsibility of country of export, 637-638
  Siam, 630
  smoking of opium, 639, 646
  United States,
    defects in early laws, 781
    for consumption, 44, 45, 675
    Jones-Miller Act, 670 et seq., 781, 783, 961-965
Imports, general regulations, 638
  India, 635
  Philippine Is., 631
  United States,
    formerly permitted, 670, 745, 749
    limitation to medical needs, 788
    medicinal opium, 640-641
    regulations, 646, 670-672, 745-748, 749 et seq., 781-783, 784-785, 787
      see also Legislation, U. S., Jones-Miller Act
    revenue, 745-748
Impotence, 193, 220, 230, 238, 253, 434, 459, 462
Imprisonment, not conducive to cure, 902
India, 56, 632, 635, 636, 638, 642, 661, 665, 681-682, 685, 688, 690, 718, 929, 938
Indian hemp, international control of, 636, 645, 693, 946, 948
  see also Cannabis indica
Indiana, 31, 810, 816, 969 et seq.
Insanity, 168, 175, 184, 186, 187
Insomnia, 107, 122, 138, 146, 190, 205, 215, 315, 319, 431, 442, 459, 622
Institute of Criminal Law and Criminology, report of, 883
Institutions,
  for after-care, 888
  mercenary, condemned, 885
  reports of, 112, 113, 114, 121, 541, 570, 577-579
  state, needed, 835
Intelligence tests in relation to addiction, 511
Intercurrent maladies, 222, 659
Internal Revenue, Bureau of, clinics closed by, 864, 876
International control,
  agreements,—*see* *sub-headings:* Hague Opium Convention; League of Nations; First, Second Opium Conference, Geneva
  essential, 645, 651, 709
  exchange of information, 675-676, 686-687, 697-698, 699, 715-716, 717, 736-737, 742
  First Hague Conference (1912) 635-646
  First Opium Conference, Geneva, (1924) 708
    Agreement, 938-941
    Final act, 943-944
    Protocol, 941-943
  Hague Opium Convention,
    American delegation report, 636-646
    Contracting Powers, 929-930
    incorporated in League of Nations Covenant, 660-661
    internal control, 641, 935
    medicinal preparations of alkaloids, 640-642, 932-934
    operation of, 653-656, 658 et seq., 934, 936-937
    powers not signatory, 643, 935-936
    prepared opium, 638-640, 931-932
    ratification, 643-644, 936
    raw opium, 637-638, 930-931

- International Control—(*Continued*)
  - Hague Opium Convention—(*Continued*)
    - revised and supplemented, 945-955
    - signatory powers, 647-648, 649-651, 654-655, 657-658, 687
    - summary, 637-645
    - text of, 929-937
    - United States' ratification of, 652, 656
  - International Opium Commission, 629, 632-633
  - League of Nations,
    - Advisory Committee on Traffic in Opium, 661-662, 665-667, 674-678, 683-687, 692-702, 710-712, 715-717, 734-737, 738-740, 740-743
    - Advisory Committee recommendation of limitation of production, importation, and manufacture, 683-690
    - American Delegation urges control of production of raw opium, 679-684
    - China invited to report on cultivation of poppy, 667-668
    - Commission of Enquiry into Production of Opium in Persia, report 720-725
      - *see also* Persia; Production; Consumption
    - cooperation of United States with, 674, 678-684, 708-709
    - governments asked to supply data of consumption, 673, 675
    - governments invited to negotiate concerning limitation of production, etc., 683-688
    - Health Committee, 675-678, 702-706
    - import and export certificate system, 673, 692
    - Indian hemp, traffic in, 693, 948
      - *see also* Indian hemp
    - India's reduction of production, 688-689
    - means of preventing abuses in European governments, 678
    - medical use the only legitimate, 676
    - no licenses for imports from countries not ratifying Convention, 674
    - penalties proposed for carrying on traffic in China, 692
- International Control—(*Continued*)
  - League of Nations—(*Continued*)
    - Permanent Central Board, 951-955
    - reports of consumption of morphin derivatives, 677
    - resolutions for holding larger conference, 691
    - sub-committee for investigation approved, 669-670
    - treatment of free ports and zones, 736-737
    - World War Treaties, 660
  - Second Hague Conference, 1913, 646-653
    - action of United States following, 653
    - American delegation report, 636-646
  - Second Opium Conference, Geneva, 1924, 708
    - control of international trade, 949
    - Convention, 945-957
    - Final act, 958-961
    - internal control, raw and manufactured drugs, 946
    - Permanent Central Board, 951-955
    - Protocol, 958
  - Shanghai Opium Conference, 1909, 629
  - Third Hague Conference, 1914, 653-658
  - United States, relations with
    - China, 659
    - Philippine Is., 631
  - United States, treaties with
    - China, 630-631, 745
    - Germany, 660
    - Japan, 631
- International law, new departure in trade regulation, 637-638
- International Opium Conference,—*see* First, Second, Third Hague Conference; First, Second Opium Conference, Geneva
- Intestinal muscle, 211, 216, 230, 277-282
- Intradermic morphin tests, 408, 409
- In-transit shipments,
  - Canada, 672
    - *see also* Legislation, United States
- Iowa, 17-18, 31, 42, 810, 969 et seq.
- Italy, 629, 632, 636, 647, 649, 650, 655, 657, 660, 661, 719, 720, 739, 929
- Itching, 216, 436

J

Jacksonville, Fla., 24-27, 47, 849
Jacobi, Joseph, 81
Jacottet, G., 178-181
Japan, 629, 633, 637, 641, 647, 649, 650, 655, 656, 657, 660, 661, 667, 684, 929,
Jarrige, J. L., 82
Jelliffe, S. E., 155, 498, 569-570
Jennings, O., 195, 536-540
Joël, Ernst, 261-277, 384-392, 919-924
Johnson, George S., 611-613
Joint Legislative Committee, New York, 495
Jones, John, 58-59
Jones-Miller Act,—*see* Legislation, U.S.
Jordan, Sir John, 689
Jouet, Daniel, 98-99, 140, 167-168, 434-435, 528
Joyce, T. F., 499, 570-571
Jugo-Slavia,— *see* Serb-Croat-Slovene State
Justin, 55
Juvenile addiction,—*see* Addiction

K

Kai, Sotaro, 305-307
Kane, F. F., 883
Kane, H. H., 64, 66, 70-73, 97, 167, 470, 527
Kansas, 31, 810, 821, 969 et seq.
Keith, B. C., 154-155
Kengla, L. A., 313
Kennedy, Foster, 147-148
Kentucky, 31, 812, 900, 969 et seq.
Keown, T. W., 81
Kidneys, 183, 205, 252, 289, 432, 438-439, 445, 446, 453, 542, 576
Klee, Ph., 595
Knopf, S. A., 129-130, 911-912
Kober, George M., 75
Kogerer, H., 218-219
Kolb, Lawrence, 41-43, 240-249, 410, 504-513, 616-627
Krafft-Ebing, R., 184-185
Kräpelin, E., 196-197, 448-449
Kraus, Walter M., 361-362, 460, 462
Krauss, R., 595-596
Kropil, 80

L

Laase, C. F. J., 155, 420-421
Lafargue, 65
Lambert, Alexander, 110-112, 148-149, 155, 316, 415, 452-455, 478, 502-503, 554-558, 598-600, 787 et seq., 887
Lancelin, L. E. R., 182-184
Lane, H. C., 371
Lang, C. T., 79
Langer, H., 316, 348-349
Latin-America, 646, 674, 708, 736, 739
Latin writers, mention of opium by, 55
Latvia, 661
Laudanum, 6, 17, 22, 61, 63, 96, 469, 486, 567, 969
Lazarus, B., 80
League of Nations,—*see* International control
Lecithin, 382-383
Legal profession, duty of, to aid, 885
Legewie, B., 234-237, 399-401
Legislation, state, digest of laws, 809 et seq., 969-981
    drugs commonly restricted, 809-810, 969-970
    enforcement methods, 820-824, 978
    legal exceptions to forbidden list, 810-812, 970
    model law suggested, 904-905
    opium smoking, 814-815
    penalties for violating law, 979-980
    possession and dispensing, 814, 815 et seq., 972-976
    registration of addicts, 819, 842-843, 977
    retail sales, 812-813, 814, 972
    tables summarizing, 969-981
    treatment of addicts, 819-820
    wholesale distribution, 813, 972
Legislation, state,—by states,
    Alabama, 820-821, 969 et seq.
    Arizona, 815, 819. 969 et seq.
    Arkansas, 809, 969 et seq.
    California, 809, 815, 821, 969 et seq.
    Colorado, 810, 815, 821, 969 et seq.
    Connecticut, 821, 969 et seq.
    Delaware, 816, 821, 969 et seq.
    Florida, 816, 969 et seq.
    Idaho, 810, 816, 969 et seq.
    Indiana, 810, 816, 969 et seq.
    Iowa, 810, 969 et seq.
    Kansas, 810, 821, 969 et seq.
    Kentucky, 812, 969 et seq.
    Maine, 810, 812, 969 et seq.
    Maryland, 812, 969 et seq.
    Massachusetts, 810, 816-817, 969 et seq.
    Minnesota, 821, 969 et seq.
    Montana, 817-818, 819, 821, 969 et seq.
    Nebraska, 818, 969 et seq.
    Nevada, 808, 810, 969 et seq.
    New Jersey, 810, 818, 969 et seq.
    New Mexico, 810, 969 et seq.

Legislation, state—(*Continued*)
  New York, 808, 810, 819, 824-843, 969 et seq., *see also* Whitney Law, first and second; Boylan Law
    Commissioner of Narcotic Drug Control, 836, 969 et seq.
    first anti-narcotic law, 1913, 824, 969 et seq.
    Narcotic Drug Control Commission, 842, 969 et seq.
    report, Joint Legislative Committee, 1917, 825-831, 969 et seq.
    report, Joint Legislative Committee, 1918, 832-835, 969 et seq.
  North Carolina, 821-822, 969 et seq.
  Ohio, 818, 969 et seq.
  Oregon, 810, 969 et seq.
  Pennsylvania, 812, 818, 819, 969 et seq.
  Rhode Island, 816-817, 969 et seq.
  South Dakota, 818-819, 969 et seq.
  Tennessee, 812, 969 et seq.
  Texas, 810, 822, 969 et seq.
  Utah, 810, 969 et seq.
  Vermont, 810, 812, 969 et seq.
  Washington, 810, 819, 820, 822-823, 969 et seq.
  Wisconsin, 823-824, 969 et seq.
  Wyoming, 812, 969 et seq.
Legislation, United States,—*see also* Exports, United States; Imports, United States
  Act regulating manufacture of smoking opium in the United States, text of, 982
  Act to prohibit importation and use of opium for other than medicinal purposes, 745; text of amendment, 966-968
  Bureau of Prohibition, regulations under, 766-767
  Federal Narcotics Control Board, 783-787
  Harrison Narcotic Act,
    administered by Bureau of Prohibition, 755
    amendments suggested by American Medical Ass'n, 893-896
    attitude of federal authorities in enforcement of, 857
    Bureau of Prohibition created for purpose of enforcement, 766-767
Legislation, United States—(*Cont.*)
  Harrison Narcotic Act—(*Cont.*)
    court decisions under, 758-766, 773-780
    digest of, 753 et seq.
    diverse opinions of, 90, 319, 768-773, 882 et seq.
    drugs included, 753
    duties of persons affected, 754
    editorial, comments on, 993-996
    faulty interpretations of, 856
    illicit traffic, effect on, of, 29, 91
    operation of, 46, 770, 772, 878, 881, 882, 884, 890, 891
    persons affected, 753-754
    physician, risks involved for, under, 769
    purchase and sale, 754-755
    regulation of medical practice by, 756-766
    regulations under, 756 et seq., 770, 772
    should not include codein, 318
    taxes, 754
    text of, 983-992
    thirty-day provision, 758, 770
    treatment of addiction only, 757
    treatment of incurable diseases, 757
  in-transit shipments, 672, 782-783, 786-787
  Jones-Miller Act,
    introduction of bill, 781
    passage of, 670-672, 783-787
    regulations under, 783 et seq.
    text of, 961-965
    White Cross endorsement of, 899
  Narcotic Drug Import and Export Act, 783-787
    see above, Jones-Miller Act
  National Food and Drug Act, 748
Legitimate medical and scientific needs,
  Committee on Drug Addictions' study of per capita use, 798-802
  DuMez's study of Allegany County, 796-798
  Lambert's estimate, 787-795
  Simon's estimate, 803-806
Letchworth Village, 888
Leukocytes, 182, 193-195, 198 et seq., 222-223, 307-310, 338, 541, 612
  see also Blood
Levinstein, E., 138-139, 431-434, 522-525

Liberia, 660, 661
Lichtenstein, P. M., 112, 419-420, 471, 492
Light baths, 543
Lind, 59
Liniments, 5, 970
Lipoid degeneration of ganglion cells, 291 et seq.
Literature, popular, influence of, 62, 100
Lithuania, 661, 687, 737
Liver, degenerative changes in, 171-173, 182, 183, 205, 250 et seq., 288, 292 et seq.
  destruction of morphin by, 346, 349, 388
  during withdrawal, 202, 222, 443-444, 543, 544, 545
  functional changes in, 138, 222, 444
  in acute poisoning, 250, 251, 292
  morphin present in, 172
  oxidimorphin demonstrated in, 350
  tolerance to morphin, 308-310
Loco weed, 810, 821, 969-970
Loofs, F. A., 381-382
Lorent, 66
Los Angeles, 36-37, 872-876
Lott, M. K., 546-548
Louisiana, 31, 91, 969 et seq.
Lowenthal, 80
Ludlow, Fitzhugh, 5
Ludlum, S. D., 277-278
Luminal, 271, 589, 597
Lungs, 283, 286, 287, 294
Lutard, A., 141
Luxembourg, 647, 649, 650, 657, 659, 661, 676, 677, 737, 935
Luzzato, R., 185
Lyttleton, Dame Edith, 689

M

Macao, 632, 639
Macht, David I., 56 et seq.
MacKay, Eaton M. and Lois L., 278-279
Mackin, M. C., 122, 215, 497
Macrobius, 55
Magnesium sulphate, synergism with morphin, 278
Maguin, M., 442-444
Maimonides, 56
Maine, 31, 810, 812, 969 et seq.
Major, J. D., 64
Manges, M., 78
Mania, 187, 190, 433, 442
Manic-depressives, liable to addiction, 108, 491
Manufacture, Canada, 639
  China, 631
  control of, 662, 689, 742, 946-948
    see also Production, control of
  Great Britain, 689
  limitation of, 638-639, 641, 742
  Macao, 632, 639
  Siam, 632
  United States, 641, 670, 674
    see also Legislation, U. S.
Marasmus, 254
Mariahuana, 810
Marikovsky, G., 341-342
Marmé, W., 321-322, 350, 365, 600, 601, 606
Marshall, O., 4-5, 9-16, 96-97, 469-470
Martin, Ernest, 55
Martinson, I. J., 81
Maryland, 31, 318, 812, 969 et seq.
Massachusetts, 7, 18-21, 31, 101, 810, 816-817, 969 et seq.
Mattison, K. B., 525-527
Mavrojannis, 335
McCormack, A. T., 155, 887, 900, 901
McCoy, G. W., 313, 896, 897
McDonald, Ellice, 277-278
McFarland, S. F., 9, 69-70, 96
McGee, J. B., 80
McIver, J., 115, 457-458, 493-494, 565
McMunn's Elixir, 4
McPherson, G. E., 120, 498
Mead, 59
Meconion, 56
Medical Society of State of New York, 161
Medinal, 590
Memory association, 617, 625-626
Mental depression, as etiological factor, 116, 118, 119, 122, 127, 128
  as withdrawal symptom, 190, 216, 227, 436, 440, 441, 447, 459, 524
Mental effects,—*see* Psychic effects; Symptomatology; Pathology
Mescal button, 810, 969-970
Mesopotamia, 54
Metabolism, basal, 233-234, 259-260
  comparison of, 260
  effect on, 190, 216, 222, 228, 234, 250-253, 305, 373, 377, 539
  impairment of, a major symptom, 190
  inhibition of, as dominant action of narcotics, 216
Mexico, 37, 632, 639, 640, 647, 649, 650, 659, 935
Meyer, E., 127-129, 473-475, 581-582

Michigan, 5, 9-16, 31, 42, 51, 96, 969 et seq.
Middle Ages, use of opium during, 56
Mignard, M., 582-588
Miller, G. H., 279-282
Miller, J. F., 781
Minimum lethal dose, 363, 410
Ministry of Health, Great Britain,—*see* Great Britain, Ministry of Health
Minnesota, 31, 821, 969 et seq.
Minors, addiction among, 117
  sale of opium to, 939
    see also Addiction, juvenile
Miosis, 238, 429, 431, 432, 457, 459
Mirto, D., 339-341
Miscellaneous suggestions,—*see* Control
Mississippi, 31, 969 et seq.
Missouri, 31, 969 et seq.
Mithridates, 57
Mithridatium, 57, 483
Mixed addiction, 107, 514, 541, 542, 921
Model state law, suggestion for, 904
Mohammedanism, influence of, 56
Monestier, M., 319-320
Montagnini, T., 83
Montana, 31, 817-818, 819, 821, 969 et seq.
Montenegro, 647, 648, 650, 657, 935
Montgomery, Ala., per capita use, 802
Montpellier, 66
Moral degeneracy, 210, 214, 238, 498
Morat, Daniel, 146, 196, 197-199, 201-204, 347, 348, 444-447
Morel-Lavallée, A., 81, 82, 83, 552-553
Morgenroth, J., 335-337
Morphin, addicts, percentage of total, 486, 541
  derivatives, reaction to, 272
  destruction of, by organism, 346, 349, 354 et seq.
  excreted in urine, 167
  hunger, 277
  immune serum, 331
  in blood of congenital addicts, 414
  injections into chick embryos, 357
  intolerance for, 167
  legitimate medical use, 661 et seq., 682 et seq., 708-709, 767, 788, 796-806
  mode of action, 214
  per capita use, U. S., 795-806
  permanence of alterations, 592
  pharmacodynamic action of, 393
  poisoning,—*see* Morphinism; Acute, Chronic opium intoxication; Addiction
  properties of, 57
Morphin—(*Continued*)
  state legislation summarized, 969-971
  storage of, in body, 172, 201, 325
Morphinism—*see also* Chronic opium intoxication; Addiction
  a psychoneurosis, 164
  a symptom, not a disease, 144
  a toxic neurasthenia, 539
  characteristics of, 141, 142, 146, 163, 375 et seq.
  defined, 140, 142
  general nature of, 137-165
  industrial efficiency in relation to, 247
  mechanism of, 399, 601 et seq.
  moral treatment of, 142
  not a psychosis, 142, 207
  not morphinomania, 140
  period of development of, 431, 435, 436, 447
  primarily an organic condition, 541
  vegetative nerve balance in, 278
Morphinomania, 116, 140, 141, 149, 456
Mucous membranes, 283
Municipal control, by arrests, ineffective, 869
  cities formerly having clinics, 876
  early laws, 807, 808
  narcotic clinics,
    Jacksonville, 42, 849-850
    Los Angeles, 36-37, 42, 872-876, 892-893
    New Orleans, 844-848
    New York City, 33-35, 850-853
    Shreveport, 863-872
  New York City,
    Board of Health Sanitary Code, 853-855, 858-860
    Narcotic Clinic, 33-35, 850-853
    Judge Collins' review of, 855-863
  San Francisco, 1875, 807
  Virginia City, Nev., 808
  wholesale distribution, 813
Muscles, 215, 254, 384, 540, 543
Musser, John H., 122-123, 215-216
Mydriasis, 455, 547
Myers, H. B., 317

N

Narcein, 57
Narcosan, 598-600, 611
Narcotic clinics, 37-43, 91, 473 et seq., 850 et seq.
  age distribution among applicants, 477-478

Narcotic clinics—(*Continued*)
  as a restraint for addicts, 892
  closed by Bureau of Internal Revenue, 91, 864, 866, 870, 875-876, 927
  coordination of state institutions, 914
  educational influence of, 38
  effect on illicit traffic, 849, 869, 870
  endorsed by organized charities, 870
    by Police Jury, 865
  important accomplishments of, 892
  Jacksonville, 42, 849-850
  legal aspects of, 847
  Los Angeles, 36-37, 42, 872-876, 892
  medical treatment of criminal addicts, 914
  New Orleans, 843-848
  New York City, 33-35, 850-853
  opposition of federal agents to, 866
  precaution in medical practice, 916
  program of N. Y. State Commission of Prisons, 912-916
  reasons for good results, 870
  re-opening of, urged, 892
  report by Bucher, 872-876
  report by Butler, 863-872
  report of Departmental Committee, Great Britain, 916-919
  Shreveport, La., 37-41, 863-872
Narcotic Drug Control Commission, N. Y., 35, 36
Narcotic Drugs Import and Export Act,—*see* Legislation, U. S.
Narcotics,
  deteriorating effects of, 244-247
  inhibiting influence on criminals, 505-507
  mechanism of action, 216
  pleasurable effects of, 240-243, 505-507
  quantities dispensed, Allegany survey, 796-797
    see also Opium, Morphin, etc.
National Food and Drugs Act, 748
Nation's Health, 907-909
Nausea, 315, 449, 450, 457, 461
Nebraska, 31, 818, 969 et seq.
Neff, I. H., 157-158, 504
Neligan, A. R., 53-54
Nephritis, 205
Nervous system,—*see* Central nervous system; *also* Pathology; Symptomatology; Sympathetic system; Parasympathetic system
Netherlands, The, 629, 635, 640, 643, 644, 646, 647, 648, 649, 650, 652, 653, 655, 656, 657, 658, 659, 660, 661, 663, 683, 684, 687, 689, 719, 929, 936, 937, 938
Neuralgia, in etiology, 98, 99, 100, 118, 128, 489
Neurotics, prone to addiction, 48, 104, 109, 126, 142, 190, 241-242, 488-489, 490, 491-494, 503, 504, 623-624
Nevada, 31, 808, 810, 969 et seq.
Neville, 683
New England, influences to addiction in, 14
  production and consumption of opium in, 7
New Hampshire, 7, 31, 969 et seq.
New Jersey, 31, 810, 818, 969 et seq.
New Mexico, 31, 810, 969 et seq.
New Orleans, 843-848
New York Academy of Medicine, 119, 880
New York City, 32-36, 43, 112, 119, 850 et seq.
  Narcotic Clinic, 33-35, 850-853
  Riverside Hospital treatment, 570
  Sanitary Code, regulation by, 853
    see also Legislation, municipal
New York Psychiatrical Society, 119, 880
New York State, 31, 36, 47, 130, 151-152, 161, 808, 810, 819, 824-843, 969 et seq.
  Commission of Prisons, 912-916
  Narcotic Commission, 34
New Zealand, 661
Nicaragua, 647, 649, 650, 659, 661, 935
Nicholson, W. W., 916
Nicoll, A., 900
Nishigishi, S., 259-260
Nissl, Franz, 175-176
North Carolina, 31, 821-822, 969 et seq.
North Dakota, 31, 969 et seq.
Norway, 647, 648, 650, 659, 661, 935
Notta, M., 99
Novocain, 969-970
Nusbaum, 67

O

Obersteiner, H., 98
Oberteuffer, D., 479
Occupational distribution,—*see* Types of users
Occupational therapy, 571, 887 et seq., 914
Odier, 59
Oedema, 205, 283
Ohio, 31, 818, 969 et seq.
Ointments, cocain, 970

Oklahoma, 31, 969 et seq.
Oliguria, 445-446
Oliver, F. E., 6-9, 94-95
Olliver, 66
Opisthotonus, 287
Opium, addicts, percentage of total, 486
  crude, control of, 783 et seq.
  cultivation, United States, 7
  defined by Hague Convention, 932
  derivatives, chemistry of, 789
    manufacture of, 679-683, 684-688
  earliest mention of, 56
  early history, 53 et seq.
    early treaties, 630
  gum, medical requirements, 793
  illicit traffic,—*see* Illicit Traffic
  imports,—*see* Imports; Importation
  intoxication, acute,—*see* Acute opium intoxication
  intoxication, chronic,—*see* Chronic opium intoxication
  legitimate requirements estimated, 703, 788 et seq.
  meaning of "legitimate" uses of, 665
  per capita use, 796-797, 798-802
  prepared, defined by Hague Convention, 931
  problem, in Germany, 919-924
    public indifference to, 138
    universality of, 634
  rosin noxious principle of, 58
  smoking,
    early measures to control importation of, 74
    export from U. S. prohibited, 939
    importation forbidden, U. S., 672, 745, 783, 963-964, 966-968
    manufacture regulated, U. S., 982
    right of seizure of, 786
  state regulation of, 969-971
  substitutes for, nonexistent, 315
  synthetic, 733
  use of, early modern, 59
    hypodermic, 9, 49, 64, 97, 823, 831, 838, 854, 878
    per capita, 798-806
Opium-eating, 5-12
Opium-smoker, first white, 73
Opium-smoking, effects of, 167
  federal laws against, 751-753, 966-968
  first white smoker, 73
Opium-smoking—(*Continued*)
  in Orient, 138
  introduction of, 73, 746
  under state anti-narcotic laws, 815, 975
  United States, 23, 73-74, 115
  withdrawal symptoms, 430, 454
Opon, tolerance to, 315
Oppolzer, 66
Orbison, T. J., 613-615
Oregon, 31, 810, 969 et seq.
Organized charities, endorsement of narcotic clinics, 870
Osler, William, 104, 436, 545
Osmosis of cocain and morphin, 402
Ottenstein, B., 401-404
Ox-gall, 558
Oxidation, in tolerance, 359
Oxidimorphin, 321-322, 350, 365, 600-608
Oxley, 167
Oxygen insufflations, 597

P

Pain, as etiological factor, 97 et seq., 119, 121, 132, 133, 138, 489, 529
  as withdrawal symptom, 159, 230, 315, 319, 375, 433, 439, 441, 442, 448, 449, 453, 457, 458, 523, 524, 545, 573, 622
    see also Etiological factors; Symptomatology
Pal, 79
Panama, 647, 649, 650, 659, 660, 661, 900, 935
Pantopon, 294, 315
Papaverin, 58, 542
Papyri mentioning opium, 55
Paracelsus, 57
Paraguay, 647, 649, 650, 661, 687, 935
Parakodin, 318
Parasympathetic system, 225-226, 239, 392-393, 602-609
Paregoric, 95, 421
  addiction among poor, 114, 122
  addicts, percentage, 486
  exempt, 796
  sales of, 17, 22
Paresthesias, 186
Parrish, Joseph, 67
Patent medicines, 21, 74, 75, 106, 121, 122
Pathology: somatic and psychic changes, 166-311
  amentia, 186
  anemia, 182, 436, 450

Pathology—(*Continued*)
  circulatory system, 170 et seq., 200-202, 216, 288, 293
  delirium tremens, 185, 187, 189
  digestive system, 171-173, 182, 183, 205, 250 et seq., 288, 289, 290, 293
  emotionality, 184
  glandular system, 224, 228, 230-231, 239, 251, 278, 328, 394, 461, 614
  hair, 238
  hallucinations, 184, 186, 205
  hysteria, 185, 187
  insomnia, 138, 146, 190, 205, 215, 431
  late mental and physical effects, 237-238
  mania, 187, 190, 433
  melancholia, 184, 187, 190, 227
  mental degeneration, 174-175
  moral degeneration, 138, 175, 184, 185, 205, 214, 215, 459
  nails, 238
  nervous system, 167 et seq., 171, 172, 175 et seq., 177 et seq., 179 et seq., 192, 193, 195, 225, 229-230, 238, 239, 254, 286, 287, 290 et seq., 297 et seq., 315, 319, 395, 602
  psychesthesias, 186
  psychoses, 186 et seq., 207 et seq.
  reproductive organs, 230-231, 238, 253, 290
  respiratory system, 287, 293
  restlessness, 216, 441, 457
  skin and mucous membranes, 173, 204, 205, 218-219, 224 et seq., 238, 283, 405
  sympathetic nervous system, 228-230, 251
  teeth, 238
  trophic changes, 216, 219
  urinary system, 193, 290, 294
Paton, Stewart, 107, 185-186, 553-554
Patten, Cecilia, D., 916
Paulus Aegineta, 55
Paveron, tolerance to, 315
Pearson, C. B., 153, 496-497
Peddling, increased by Harrison Act, 29, 91, 858
  international organization of, 908
  menace of, 910, 911
  profitable in cities, 35, 36, 39, 903
  reduced by narcotic clinics, 39, 41, 869, 873, 880, 892
  should be made a felony, 913
    see also Illicit traffic; Smuggling
Pelletier, 57-58
Pellini, E. J., 363-371
Pennsylvania, 31, 812, 818, 819, 969 et seq.
Pepper, William, 99-100, 528-530
Per capita use, opium and coca leaves, 798-802
Pereira, J., 431
Period of development, 333, 431, 433, 435, 436, 447
Periods, four, of morphinism, 456
Peristalsis, 211, 216, 230, 277-282
  stimulated by strychnin, 549, 552
Perkins, Roger G., 897, 902-905
Peronin, 58, 80, 318, 702
Persia, 629, 632, 647, 649, 650, 655, 657, 661, 665, 681, 683, 687, 690, 711, 716-718, 720 et seq., 740, 929
    see also International control, League of Nations
  Commission of Enquiry into the Production of Opium in: report, 720-725, 729-735
  control of production in, 690, 713, 716, 720 et seq., 728, 729, 732-734, 740
  reply of government to League of Nations, 725-729, 961
Persians, ancient, 54, 55
Personality, effect on, 231-232, 374-377, 505-507, 584
Peru, 647, 648, 649, 650, 660, 661, 682, 935
Peterson, Frederick, 113, 455
Pettey, G. E., 83, 109, 145-146, 152, 209-211, 316, 346, 417-419, 449-451, 548-552
Peyote, 810, 821, 969
Phagocytosis, 183, 184
Pharmacodynamic action, 224, et seq., 393
Phenylhydrazin, 387
Phenylhydroxyl group, 387
Philadelphia, 113, 115
Philadelphia General Hospital, 113
Philippine Islands, 23, 631, 639, 646, 654
Philonium, 483
Photophobia, 444
Physicians, addiction among,—*see* Types of users
  attitude of toward Harrison Narcotic Law, 90, 319, 768-773, 864, 822 et seq., 993 et seq.
  personality important, 533, 562
  responsible for addiction, 94 et seq., 893
  under Harrison Narcotic Law, risks of, 769
  under state laws, 815-819, 972-976

Physicians—(*Continued*)
  undue regulation of, 858, 884, 891, 896, 898
Physostigmine, action of, 277-278
Pichon, G., 102-104, 140
Picrotoxin, 271
Pierce, I. H., 307-311, 462
Pilcher, J. D., 405-409
Pilliet, 172-173
Placenta, 413
Plant, O. H., 279-282, 307-311, 462-467
Platerus, 57
Pliny, 55
Poland, 660, 661
Police department, deplores closing of clinics, 870
Pollak, J., 80
Portal engorgement in withdrawal, 550-551
Porter, Hon. Stephen G., 678-683, 708-709
Ports, at which imports may be made, 783
Portugal, 629, 632, 639, 640, 649, 650, 657, 660, 661, 684, 929, 938, 943-944
Potter, S. O. L., 317
Powers, 876
Powers not signatory to Hague Convention, 935
Prangen, Hon. R. M., 151-152, 825-831, 832-835
Pravaz, 66
Predisposition, 121, 125-129, 141, 207 et seq., 212, 214, 241, 490, 503 et seq., 583, 589, 617, 676
Pregnancy, 410-428
Prentice, A. C., 313, 893, 896
Prescriptions, injudicious use of, by laymen, 96
  Jacksonville, Fla., free, 849
  under Harrison Act, 759-766
Price, G. E., 115, 457-458, 472, 493-494, 565
Prisons,
  City Prison, Manhattan, report, 112
  etiological factors, report, 114, 121
  increased addict population in, 510
  N. Y. State Commission of 479, 912-916
  percentage of drug addicts in, 214
  recommendations, 912
  San Quentin Prison, report, 114
Probation system, for cured addicts, 888
Production
  China, 632-634, 635, 642, 666, 669,
  coca, Bolivia, 682, 683
Production—(*Continued*)
  coca—(*Continued*)
    Java, 682
    Peru, 682, 683
  India, 665, 681-682, 683, 685, 688, 690
  Persia, 632, 681, 683, 690, 730-733
    see also Production, control of, Persia
  Turkey, 632, 681, 683, 687
  world figures for 1922, 44
Production, control of, 662, 673, 679-683, 684-688, 689, 708-709
  Persia, 713-715, 720-725, 728, 729, 732-734, 740, 961
  resolution by Congress, 681
Prognosis, 610 et seq.
Prohibition Commissioner, Federal, rulings by, 858
Prophylaxis, 528-530, 576, 882
Prostitutes, influence of, 94, 114, 119, 120, 122
Protein, alfalfa, treatment, 614
Protocol, Hague Opium Convention, 645, 647-649, 656, 936, 945, 958
  see also International control, Hague Opium Convention
Psychaesthesias, 186
Psychic effects, 138, 139, 166, 174, 185, 186, 188, 190 et seq., 205, 207 et seq., 211, 213-215, 227-228, 232, 235-237, 240 et seq., 247, 248, 261 et seq., 442, 447-448, 450, 452, 455, 456, 457, 459, 460, 582, 891
  see also Pathology; Symptomatology
Psycho-analysis, value of, 889
Psychology of addiction, 579, 582-584
Psychopathic criminals less dangerous when inflated, 510
Psychopathology,—*see* Pathology; Psychic effects
Psychopaths, predisposition of, 128, 141, 207 et seq., 212, 214, 241, 244, 540, 583, 589, 676
Psychopathy, in relation to addiction, 243-244, 509-510
Psychosis,—*see also* Pathology
  concurrent, case of, 207 et seq.
  early view of, 207
  morphinism a distinct, 150
  morphinism not a specific, 186, 207 et seq.
  of withdrawal, 187 et seq., 212, 226, 457
  one of exhaustion, 188
Psychotherapy, 573, 582-588, 595-596, 610, 889

Public education urged, 530, 707, 853, 884 et seq., 897-898, 911, 913
Public health, 164, 748, 893, 907-909
  responsibility of officials, different opinions, 900 et seq.
  State and Provincial Health Authorities of North America, report, 897-899
  see also Great Britain, Ministry of Health; International control, League of Nations; New York City Sanitary Code
Pulse, 205, 348-354, 448, 449, 453, 457, 458, 525, 601
Pupil, 205, 213, 238, 281, 354, 429, 431, 432, 435, 453, 457, 459
Pure Food and Drugs Act, 75
Pyres, 56
Pyrexia, 442, 450
Pyrodin, 387

Q

Questionnaires, xiv-xv, 6, 10, 17, 19, 22-23, 30-32, 121, 122, 318, 423-427, 479, 488, 803-804

R

Racial groups, most subject to addiction, 95, 409-410
Rainey, Henry T., 154-155
Reach, F., 211
Records required under state laws, 814
Re-education, 538, 577, 587
Reflexes, 274, 450, 457, 579
Registration of addicts, 35, 37, 842
Regulation,—*see* Control, Legislation
Rehabilitation, methods for, 879, 883, 886, 887-888, 889, 895, 909, 911, 914, 922
Reiche, A., 416
Relapse, causes of, 591-594, 617, 620 et seq., 625, 627, 914
  factors affecting, 616 et seq.
  less frequent than supposed, 616
  period intervening before, 591
  prevention of, 528-530, 576, 588, 594, 882, 914
  reasons, given by addicts for, 620 et seq., 914
  relation of to legislation, 616
Reproductive organs,—*see* Symptomatology; Pathology; Sex function
Research, medical, in opium problem, 895, 897, 912, 915, 927
Respiratory center, 212-213, 234, 354 et seq., 393
Respiratory system,—*see* Symptomatology; Pathology
Restlessness, 441, 457, 458, 533, 534, 535, 545, 568
Revenue,—*see* Government control; Exports; Imports, United States
Rhein, J. H. W., 125, 156, 498-499
Rhode Island, 31, 816-817, 969 et seq.
Richet, 66
Robertson, Thomas W., 848
Robiquet, 57
Rogues de Fursac, J., 116, 150, 319-320, 456-457
Rojas, Nerio, 596-597
Rome, 56
Römer, C., 588
Rooney, James F., 152
Roosevelt, President, message, 633-634
Rosanoff, A. J., 116, 150, 456-457
Rosenwasser, Charles, 152
Roubinovitch, J., 65, 72
Roumania, 647, 648, 650, 657, 660, 661, 935
Rubin, Solomon H., 149, 877-878
Rubsamen, W., 343
Runkel, J., 80
Ruppaner, 66
Rush, 59
Russia, 629, 647, 649, 650, 655, 657, 929
Rynd, F., 65

S

Sainsbury, Harrington, 415-416
Saint Martin, T., 80
Sale of drugs,—*see* Control
Salivation, 202, 212, 249, 281, 382, 435, 436, 443, 444, 461, 463
Salvador, 649, 650, 661, 935
San Quentin Prison, 114
Sandoz, C. E., 159-160, 219-220, 428
Saratschow, 173-174
Sato, Kyusaburo, 305
Sayre, Lewis A., 65
Scanzoni, 66
Scarborough, Eleanor M., 255-258
Sceleth, C. E., 116, 150, 566-567
Scheffel, Carl, 117-118, 884-885
Schmidt, Constantin, 101, 140
Schneider, K., 206-209
Schoen, R., 233-234
Schübel, K., 373
Schütz, Otto, 192-193
Scopolamin, 356, 387, 550, 555, 563, 566, 570, 571
Scott, L. C., 161-162, 905-907
Scribonius Largus, 56
Seaman, Valentine, 59-60

Secretary of the Treasury, Special Committee of Investigation, 30-32, 120, 472, 497
Secretions, 167, 202, 212, 233, 315, 326-329, 373, 393, 430, 433, 435, 436, 443, 445, 449, 460, 461, 463, 543
Sedimentation, rate of, 238-239
Seidlitz water, 542
Self-administration, 98, 120, 121, 132
Self-cures, 619
Serapio, 56
Serb-Croat-Slovene State, 660, 661, 719
Sero-precipitation reaction, 340
Serturner, 57
Servia, 647, 648, 650, 654, 655, 935
Sex distribution, 43, 61, 469-475, 484
Sex function, 193, 204, 216, 219, 230-231, 238, 434, 446-447, 449, 459, 461
Shoemaker, John V., 142, 193, 489-490
Shreveport, La., 37-41, 864-872
  see also Narcotic clinics; Extent
Siam, 629, 630, 632, 649, 650, 655, 656, 657, 659, 660, 661, 684, 929, 938, 944, 961
Simon, Carleton, 46, 130-131, 804, 863
Sioux City, Ia., per capita use, 802
Skin, 173, 204, 205, 218-219, 224 et seq., 238, 253, 405 et seq., 461
  See also Symptomatology; Pathology
Slocum, M. A., 131
Smith, G. H., 430
Smith, W. G., 60-61
Smooth muscle reaction, intestines, 211, 216, 230, 277-282
Smuggling, extent of, 45
  increased by import tax, 74
  into jails, 864
  of heroin, 484
  from Mexico, 37, 640
  through post office, 717, 735
Sneezing, 431, 444, 448, 449, 454, 457
Sodium sulphate, 576
Sollier, Paul, 83, 141, 220-223, 314-315, 325-330, 422, 437-441, 540-545
Sollman, Torald, 237-238, 320, 405-409
Somatic changes,—*see* Pathology
Somerville, William G., 130, 164, 910-911
Soothing syrups, 75, 95, 96, 123
South Africa, 661, 693
South Carolina, 7, 31, 969 et seq.
South Dakota, 31, 818-819, 969 et seq.
Spain, 647, 649, 650, 657, 659, 661, 935
Spartein, 536, 551, 576-577
Specificity of habituation, 273 et seq.
Speech, disturbances of, 189, 386
Spinal cord, 169 et seq., 178 et seq., 192, 284
Spleen, 252, 290, 295
Sprague, G. P., 489-490
Stages of morphinism, 456
Stanford-Binet tests on addicts, 511
Stanley, L. L., 113-115
State and Provincial Health Authorities of North America, Conference, report, 1921, 897-899
Steatosis, 173
Steele, E. H., 613-615
Sterility during addiction, 193, 231, 238, 253, 432, 454, 459, 460
Stern-Piper, L., 238-240
Stewart, W. B., 81
Stillé, A., 95, 522
Stimulants, experiments with, 271
Stomach, 234, 281, 283, 323, 326 et seq., 438, 533, 539, 568
Stovain, 810
Striatal symptoms, 287, 300 et seq.
Strube, G., 77-78
Strychnin, 219, 271, 546, 547, 548, 549, 553, 554, 563, 568, 578
"Subacute maximal poisoning," 175
Subconscious mind, 889
Suicide, 290, 296, 453, 572, 870
Sulphonal, 546, 578
Sumerians, 53, 54
Surveys,—*see* Extent
Swaine, George D., 154, 495-496
Sweating, 167, 185, 315, 326, 436, 439, 446, 448, 454, 457, 458, 461, 568
Sweden, 647, 648, 650, 657, 661, 676, 677, 935
Switzerland, 647, 648, 649, 650, 657, 661, 665, 676, 677, 687, 703, 707, 935
Swords, M. W., 843-848
Sydenham, 57
Sylvius de la Boe, 57
Sympathetic system, 225-226, 228-230, 234, 239, 251, 382, 392-395, 432, 460, 569, 602-609
Symptomatology,—*see also* Pathology; Addiction; Chronic opium intoxication; *and under individual organs*
  addiction symptoms, 432, 456, 459, 464
    circulatory system, 170, 194-195, 198-202, 203, 205-206, 221-224, 239, 302, 307, 311, 432, 437-438, 449, 453, 456
    digestive system, 138, 173, 177, 202, 205, 225, 230, 252, 393, 430, 432, 435, 438, 444, 449, 453, 459, 464

Symptomatology—(*Continued*)
  addiction symptoms—(*Continued*)
    glandular system, 326, 432, 435, 445, 460, 462, 602, 614
    nervous system, 136, 139, 146, 168 et seq., 173, 174, 176-178, 186, 193, 195-196, 205, 266, 277-282, 431, 432, 441, 447, 450, 452, 455, 456, 457, 459
      see also Psychic effects
    respiratory system, 432, 443, 453, 460
    reproductive organs, 167, 193, 204, 230-231, 238, 253, 432, 446-447, 454, 459, 460, 461, 462
    skin and mucous membranes, 204, 205, 431, 432, 453, 454, 461, 604
    urinary system, 182, 185, 193, 203, 233, 238, 290, 379, 432, 437, 438, 454
  withdrawal symptoms, 439, 449, 457-458, 459, 460-461, 464 et seq.
    circulatory system, 433, 437, 443, 449, 451, 457, 458, 459, 460, 461
    classified, 460-462
    digestive system, 136, 146, 202, 222, 230, 315, 319, 430, 431, 433, 436, 438, 443, 444, 448, 449, 450, 451, 454, 457, 458, 459, 461, 463, 464, 465, 523, 536, 543-544
    duration of, 315
    glandular system, 167, 197, 202, 326-329, 431, 433, 435, 444, 445, 543, 622
    nervous system, 184, 185, 186, 187, 188, 197, 225 et seq., 234-237, 315, 319, 436, 441, 442, 443, 449, 450, 452, 457, 458, 459, 461, 464, 465, 466, 622
    reproductive organs, 230-231, 238, 458, 459, 461, 544
    respiratory system, 443, 454, 459, 460, 464
    skin and mucous membranes, 167, 204, 315, 436, 461
    urinary system, 167, 438, 443, 445-446, 542
Synergism, between morphin and magnesium sulphate, 278
Synthetic substances, state control of, 969
Sysak, N., 250 et seq., 292-293

T

Tacoma, Wash., per capita use, 802
Takayanagi, T., 404-405
Tariffs, early, on opium, 745
Tatum, A. L., 249-250
Taylor, Isaac E., 65
Teeth, 204, 453
Temperament, 129, 149, 621, 623, 624
Temperature, 450
Tennessee, 7, 25, 27-29, 31, 37, 40, 42, 812, 969 et seq.
Tenney, Charles D., 632-635
Teruuchi, Yutaka, 305
Terry, C. E., 24-27, 110, 320-321, 471, 476
Testicles, 290
Texas, 31, 546, 810, 822, 969 et seq.
Text of
  Agreement, First Opium Conference, Geneva, 1924, 938-941
  Convention, Second Opium Conference, Geneva, 1924, 945-957
  Final Act, First Opium Conference, Geneva, 1924, 943-944
    Second Opium Conference, Geneva, 1924, 958-961
  Hague Opium Convention, 929-937
  Harrison Narcotic Act, 983-992
  Jones-Miller Act, 962-965
  Protocol, First Opium Conference, Geneva, 1924, 941-943
    Second Opium Conference, Geneva, 1924, 958
Thebain, 56, 57-58
Thebes, 56
Theophrastus, 56
Therapeutic needs, legitimate,—*see* Consumption, legitimate requirements
Theriaca, 57, 483
Thompson, R. Campbell, 54
Thompson, William Gilman, 142
Thyroid gland, 239, 255-258, 260, 380, 392 et seq., 461, 602 et seq.
Tilney, Frederick, 598-600
Tolerance, 312-428
  adrenalectomy, effect of, on, 278
  alimentary canal, 279 et seq.
  antidotal substance in, 164, 216, 324, 325, 344, 363, 372, 395
  blood, 307 et seq.
  cross, 314, 317
  definitions of, 312, 330
  due to changes in nerve cells, 571
  effect of liver action on, 345, 346, 348
  experiments in, 212, 213, 278, 314

Tolerance—(*Continued*)
  fundamental characteristic of addiction, 312
  Harrison Act does not take into account, 770-771
  in neuropathic subjects, 141
  intestinal muscles, 279 et seq.
  intradermic test, for, 408
  leukocytes, 194
  lipoid feeding, effect of, on, 213, 356
  liver, 308, 310
  mechanism of, 337, 354, 362, 384 et seq.
  medullary centers, 354-356
  nervous centers, 212, 354-356
  oxidimorphin theory of, 321-322, 350, 365, 600-608
  pulse frequency in, 205, 206
  pupil, 354-356
  resembles a true immunity, 324
  selective, of special organs, 386
  to codein and derivatives, 313 et seq.
  to heroin, 81, 316 et seq.
  to non-protein substances, 396
  vagal center, 205
Tompkins, E. D., 80, 81
Towns-Lambert treatment, 555-558
Toxemia, 216-217, 449-451, 549, 562
Trade regulation,—*see also* Imports; Exports
  by mutual control, 637-638, 639, 641, 653, 673, 674
  China, 630-631, 632, 663, 684, 685, 686, 741
  Mexico, 639-640
Transshipments,—*see* In-transit shipments, Canada; Legislation, United States
Treatment, 517-628
  see also Withdrawal
  abrupt withdrawal, 146, 185, 186, 441-442, 448, 454, 518, 522, 530, 531, 580
  adalin, 578
  adrenalin, 596-597
  after-care, 580, 588, 886, 887, 889, 914
  alcoholic stimulants, 523, 525, 537
  alfalfa protein, 598, 614-615
  atropin, 537, 538, 546
  belladonna, 346, 537, 555-557, 559, 563, 565, 578, 579
  berberine sulphate, 597
  bicarbonate of soda, 523, 539
  bismuth subgallate, 548
  black pepper, 522

Treatment—(*Continued*)
  boldin, 577
  bromides, 525, 536, 548, 554, 558, 576, 578, 581, 597
  caffein, 537
  calomel, 542, 544, 545, 552, 578, 599
  camphor oil, 577
  cannabis indica, 522
  castor oil, 554
  cataplasms, 523
  chemical method, 532
  chloralamide, 546
  chloral hydrate, 524, 537, 546
  chloroform compresses, 523
  cholagogues, 576
  cholin, 382, 595
  chloralose, 546
  cinchona, 554
  coal-tar derivatives, 537
  cocain, 531
  codein, 525, 526
  coffee, 537
  cold packs, 554
  colombo, 522
  conium, 558
  consolidation period, 587, 588
  convalescent, 573, 580, 588, 590, 886, 914
  criteria for, 520-521, 562
  diet, 524, 533, 543, 545, 546, 554, 558, 569, 576
  digitalis, 546, 547, 558, 576, 578
  directed against toxemia, 540 et seq., 549 et seq., 563-565
  dosage, reduction of, 521, 532, 533, 535, 539, 560-562, 566, 568-570, 571, 575
  duboisine, 537, 546
  during intercurrent diseases, 222, 569
  empiric for most part, 627-628, 884
  enforced, 540, 822, 870
  ergot, 554
  excessive purgation condemned, 563-564
  exercise, 522, 553, 567, 571
  extractum thebaicum, 537
  friction, 522
  fundamental mistake in, 541
  gelsemium, 537
  ginger, 522
  gradual withdrawal, 144, 529, 530, 531, 534, 536, 537, 561, 567, 568, 569, 572, 580
  hydrotherapy, 459, 522, 524, 540, 558, 567, 569, 571
  hyoscin, 536, 537, 546-547, 563, 570, 571, 578, 580, 589

- Treatment—(*Continued*)
  - hyoscyamus, 555, 559, 563, 578, 579
  - hypnotics, 270, 525, 546, 578
  - hypnotism, 532, 540
  - individual, 578
  - institutional, 522-523, 527, 531, 534, 536, 537, 545, 854-855, 913, 914
  - iron, 522
  - isolation, 523, 527, 531, 568, 570, 572
  - light baths, 543
  - luminal, 597
  - lupulin, 522
  - massage, 459, 553
  - medinal, 590
  - mentha piperata, 523
  - methods analyzed, 531, 565, 567
  - moral medication, 586-587
  - mustard plasters, 523
  - narcosan, 598-600, 611-613
  - nitroglycerin, 536
  - nux vomica, 523, 554
  - occupational therapy, 571, 886, 887, 914
  - ox-gall, 558
  - oxygen insufflations, 597-598
  - paraldehyde, 537, 578, 589
  - "perturbative method," 518
  - phosphoric acid, 522
  - pilocarpine, 538, 543, 547
  - piturine, 537, 538
  - preparatory, 542, 559
  - psychotherapy, 572-574, 579, 582-588, 595-596, 610, 889
  - purgative, 540 et seq., 563, 564, 565, 579
  - quassia, 522
  - quinine, 522
  - rapid withdrawal, 521, 525-527, 530, 531, 532-533. 541-545
  - re-education, 538, 587
  - Sanitary Code, New York City, 854-855
  - scopolamin, 356, 387, 550, 555, 563, 566, 570, 571
  - Seidlitz water, 542, 543
  - sodium sulphate. 576
  - spartein, 536, 551, 576-577
  - strychnin, 219, 271, 546, 547, 548, 549, 553, 554, 563, 568, 578
  - substitution, 318. 518-519, 531, 553, 558-559, 563-566, 568-569
    - *see also* rapid withdrawal
  - sulphonal, 546, 578
  - therapeutic baths, 522, 524, 543, 567, 571
- Treatment—(*Continued*)
  - time required, 521, 533, 535, 541, 552, 560-561, 570-571, 572, 577, 581, 590, 591, 592, 594-595
  - Towns-Lambert treatment, 555-558
  - under Harrison Narcotic Act, 757
  - veronidia, 576
- Tremors, 138, 185, 215, 441, 456, 459, 464, 535
- Trional, advocated, 525, 546, 578
  - condemned, 544
- Trophic changes, 190, 219, 225
- Trousseau, 66
- Tschisch, W. von, 168, 171, 173
- Turkey, 95, 123, 632, 647, 648, 650, 654, 655, 665, 681, 687, 716, 718, 735, 739, 935
- Turkish baths, 540
- Turnauer, B., 79
- Turner, 899
- Twitching, 536, 543
- Types of users,
  - according to
    - age, 474-485
    - constitutional make-up, 108, 125, 126, 214, 488, 504, 882
    - intellectual status, 121, 491, 493, 495, 496, 500, 501, 504, 510 et seq., 578
    - mental balance, 125, 126, 128, 207, 212, 214, 240, 491, 509-512
    - moral character, 147, 210-211, 492, 497, 498, 499, 501
    - nervous balance, 48, 132, 190, 248-249, 488, 491, 498, 595, 617, 623-624, 882
    - sex, 469-475
    - social status, 209-211, 487, 492, 496 et seq., 497, 500, 888
  - alcoholics, 105, 130
  - cyclothmics, 108
  - degenerates, 103, 116, 128
  - delinquents, 126, 490, 491-492, 495
  - emotionally unstable individuals, 103, 108, 126
  - imbeciles, 491, 499, 500
  - industrial workers, 487, 492
  - infants, 106
  - intellectuals, 98, 116, 126, 487, 496, 500, 501, 510, 511, 624
  - medical students, 116
  - mental defectives, 121, 504, 512, 578
  - neurotics, 104, 109, 126, 142, 241, 242, 488-489, 490, 491, 492, 493, 494, 503, 504, 617, 623-624
  - nurses, 112, 116, 492

Types of users—(*Continued*)
  pharmacists, 116, 123, 130, 489, 497
  physicians, 106, 112, 113-114, 116, 118, 123, 127, 130, 245, 489, 492, 496, 497, 511
  prisoners, 114
  professional persons, 100, 104, 106, 112, 116, 118, 123, 127, 245, 492, 496, 500, 511
  prostitutes, 119, 122, 126, 469, 470, 472, 488
  psychopaths, 108, 125, 128, 243, 491, 493, 499, 505, 509-510, 512, 540-589, 595, 603, 623-624
  soldiers, 484
  sufferers from painful diseases, 125, 129, 490, 499, 500, 501, 502, 503, 528, 529
  underworld users, 120, 126, 471, 472, 473, 492, 495-496, 497, 499, 500, 501, 624
  upper social class, 106, 114, 469, 488, 496
Tyson, James, 109, 441, 545-546

U

Underworld,—*see* Types of users
United States,—*see also* Legislation United States
  part played in international control, 629-639, 640-647, 649-660, 670-672, 677, 678-683, 684, 685, 688, 690, 691, 708-709, 929
  report of Government on "The Traffic in Opium and Other Dangerous Drugs,"
    in 1926, 804-806
    in 1927, 806
United States Treasury Department,
  report on etiology, 120
  survey of extent, 30-32
Universal Postal Union, control through, 645
Uremia, morphin tolerance in, 278
Urinary system,—*see* Symptomatology; Pathology
Urine, in addiction, 167
  in withdrawal, 202, 203, 238, 438, 445, 453
    see also Pathology; Symptomatology
Urticaria, 224
Uruguay, 647, 648, 649, 650, 657, 658, 659, 660, 661, 935
Utah, 31, 810, 969 et seq.

V

Vacuolization, 168 et seq.
Vagal center, 205, 206, 281, 348, 355, 385, 386, 393
Vagus, 277-278, 301, 302, 382, 601
Valenti, A., 349-354, 451
van Deventer, C. Th., 648
van Dongen, K., 212-213, 281, 354-356
van Dyke, Henry, 653, 654-656
van Egmond, A. A. J., 205-206, 281, 348
van Helmont, 57
van Kleek, L. A., 421-422
van Swinderen, 648-649
Vasomotor changes, 354, 433, 443, 621
Vascular changes,—*see* Pathology
Vegetative nervous system,
  effect on, 228-230, 278, 362, 377, 394, 602 et seq.
    see also Sympathetic, Parasympathetic system
Venezuela, 647, 649, 650, 657, 659, 661, 935
Vermont, 7, 21-23, 31, 810, 812, 969 et seq.
Veronal, with morphin, 297
Veronidia, 576
Veterinarians, under Whitney Law, 832
Vichy water, 539
Viguer, E., 441
Vinnedge, W. W., 150
Virgil, 56
Virgin Islands, 991
Virginia, 7, 31, 969 et seq.
Vocational guidance of addicts, 887 et seq.
Vomiting, 146, 326, 436, 443, 449, 453, 454, 457, 459, 463, 464, 465, 523
von Tschisch, W., 168-171, 173

W

Wade, Frank E., 916
Washington, 31, 810, 819, 820, 822-823, 899, 969 et seq.
Washington and Taylor, 65
Waterman, Paul, 155, 887
Watson, William T., 318-319
Weight of body, 219, 237, 257, 309, 378, 431, 436, 448, 449, 463, 543
Weimann, W., 282-296
Weinstock, Leon C., 916
Weiss, J., 79
West Coast, 14
West Virginia, 31, 969 et seq.
Whiskey, 553
White Cross, 899
White, W. Hale, 214, 462

White, William A., 118, 155, 318, 459, 498, 569-570
Whitney, Hon. George H., 151-152, 825-831, 832-835
Whitney Law, First, 831 et seq.
Whitney Law, Second,
  passage, 836
  provisions of, 836-842
  repeal of, 853
Whitta, Sir William, 107, 142
Wholey, C. C., 108-109, 163-164, 228-233, 373, 377, 416, 490-492, 577-579
Wierzbicki, S., 79
Wiesner, J., 80
Wilcox, R. W., 317
Will, education of, 538, 587
Willcox, Sir W. H., 162-163, 395, 580
Williams, E. H., 319, 613-615, 890-893
Wilson, J. C., 104-105, 174-175, 414
Winslow's Soothing Syrup, 95, 96
Wisconsin, 31, 823-824, 969 et seq.
Withdrawal,—*see also* Pathology; Symptomatology; Treatment
  abrupt, 146, 185, 186, 441-442, 448, 454, 518, 522, 530, 531, 568, 580
    alcoholic stimulation in, 524, compared, 536
    modified, 525
    perturbative method, 518-519
  collapse in, 146, 159, 165, 431, 434, 442, 443, 449, 454, 455, 457 et seq., 524, 525, 566, 568, 621
  dangers in, 146, 290, 296, 329-330, 431, 434, 442, 443, 449, 453, 454 et seq., 524, 566, 568, 572, 621, 870
  disturbance of cell balance, 403
  during intercurrent illness, 222, 569
  during pregnancy, 411 et seq., 529
  genesis of disturbances during, 354
  gradual, 144, 529, 530, 531, 534, 536, 537 et seq., 561, 567, 568, 569, 572, 580
    dosage in, 560-562, 567-568
  in heroin addicts, 83
  individual rate of, 567
  psychoses,—*see* Psychosis
Withdrawal—(*Continued*)
  rapid, 521, 525-527, 530, 531, 532-533, 541-545, 566
    codein in, 526-527
    dosage in, 521, 532-533
    origin of, 525
  rate of, individual, 567
  reduction of dosage, 521, 532, 533, 535, 539, 560-562, 566, 568, 570, 571, 575
  report of 34 cases, 198
  restored glandular functioning, chief characteristic of, 327
  time required to complete, 521, 533, 535, 541, 552, 560-561, 570-571, 572, 577, 581, 590, 591, 592, 594-595
Withdrawal symptoms, real, not a mental attitude, 159
Witthauer, K., 80
Wood, Alexander, 65, 66, 67
Wood, George B., 137-138, 518
Wood, G. W., 81
Wood, Horatio C., Jr., 80, 878-879
Wood, Thomas D., 479
Worcester, 8
Work, necessity of, 883, 887 et seq.
Wren, Sir Christopher, 64
Wright, C. A., 613-615
Wright, Hamilton, 74, 631-646, 745-747, 748-749, 750, 751-752, 795
Wuth, O., 392-395, 580-581, 602-604
Wyoming, 31, 812, 969 et seq.

X

Xanthalin, 58
Xanthoxylin, 572

Y

Yen shee, 969-970
Young E., 51

Z

Zahle, Herluf, 959
Zambaco, D. A., 411

DATE DUE

[redacted]

JUN 30 2018

GAYLORD

PRINTED IN U.S.A.

HV5816 .T32
The opium problem
Princeton Theological Seminary-Speer Library
1 1012 00140 1480